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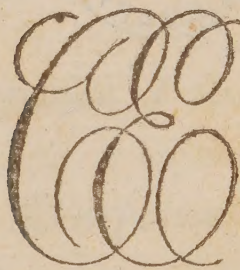
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VOLUME IV.



E D I N B U R G H :

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AND G. G. J. & J. ROBINSON, LONDON.

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B E N J A M I N

MEMBER OF THE ROYAL COLLEGE OF SURGEONS

OF IRELAND AND KENT

ONE OF THE SURGEONS TO THE ROYAL HOSPITAL

AND NEWBURY HOSPITAL

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E D I T O R

THE LONDON CHURCH

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THEORY AND PRACTICE  
OF  
S U R G E R Y.

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CHAPTER XXVII.

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SECTION XIX.

*Additional Remarks on Diseases of the Eyes.*

**I**N the last volume of this work, I treated so fully of the diseases of the eyes, that it was not my intention to say any thing farther upon them: But since the publication of that volume, a foreign oculist, Mr Jean François Pellier, having appeared in this country, where he has already ac-

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quired

quired much reputation, I consider it as a necessary addition to the chapter on these diseases, to communicate such parts of Mr Pellier's practice as appear to be of importance. Possessing the advantages of a liberal education, a sound judgment, and much experience, Mr Pellier has been enabled to suggest improvements in the treatment of almost every disease to which the eyes are liable; and an uncommon degree of steadiness, conjoined to a quick eyesight, give him a command of himself and a facility of operating which is not often attained. I think it proper likewise to remark, that Mr Pellier communicated his knowledge of the diseases of the eyes in the most candid manner; which puts it in my power to lay his observations before the Public, he having given me permission to do so.

While, by giving an early account of material improvements, I thus acquit myself of an obligation to the public, I at the same time embrace, with much satisfaction, the opportunity which it affords of announcing



nouncing the merit of an operator, who, although a stranger and as yet not much known in this country, is perhaps one of the best oculists now in Europe.

In the first place, I shall mention what I have learned of Mr Pellier's practice; and shall then offer such remarks as occur to me upon it.

On the subject of the cataract his observations are particularly valuable. By attentive examination he can almost in every instance say whether a cataract is hard, somewhat soft, or altogether fluid; and as his method of operating varies according to these circumstances, it is of importance to be able to determine *à priori* with regard to them. He can also ascertain whether a cataract is of a large or small size; by which he is often directed in the different steps of the operation.

I know that these are circumstances which practitioners in general consider it as impossible to judge of with any degree of precision, particularly with respect to the consistence of cataracts; and I must

acknowledge, that I was clearly of this opinion, till of late that I was convinced of the contrary, not by Mr Pellier's assertions alone, but by different proofs of the fact. I assisted Mr Pellier in different cases where the cataract was extracted: in all of them he previously foretold the consistence and size of the cataract with perfect confidence; and in every instance his prognosis was precise and accurate. I am credibly informed, too, that this happened with other practitioners in whose presence he operated in different parts of this country.

Mr Pellier's definition of a cataract is, That it is a morbid affection of the crystalline lens producing different degrees of opacity either in the lens itself; in the small quantity of fluid with which the lens is surrounded; or in the capsule which contains it.

He distinguishes several varieties of cataract, which in practice ought to be kept in view.

The three principal varieties which he  
mentions

mentions are, the true or curable cataract; the mixed or doubtful kind; and the false or incurable.

1. The curable, or what he terms the true cataract, is known by the pupil retaining its natural power of contracting and dilating in full perfection, while the patient is at the same time able to distinguish the light of a candle, or of any other luminous body, and even certain bright colours, such as red, green, &c.

2. The mixed or doubtful cataract is attended with a weak feeble contraction and dilatation of the pupil, and the patient can scarcely distinguish light from darkness. Along with an opacity of the crystalline, this is supposed to be attended with an affection of the retina, or of some other part of the eye.

3. In the false or incurable cataract, along with an opaque state of the lens, there is evidently a diseased state of the pupil, which remains always immovable to whatever degree of light it may be exposed, at the same time that the patient does not

B 3                      distinguish



distinguish between the most brilliant light and perfect darkness.

Cataracts may be either simple or compound, or they may be complicated with other affections.

1. A simple cataract is a mere opacity of the crystalline lens, all the other parts of the eye remaining perfectly sound.

2. A cataract is said to be of a compound nature, when blindness is produced by an opaque state of the body of the lens, of the liquor which surrounds it, and of the capsule.

3. The disease is considered as complex, when it is conjoined with other affections of the internal parts of the eye; the most frequent of which is an amaurosis.

It is not unfrequently, too, attended with a dissolution of the vitreous humour, and sometimes with an opacity of it. This variety of the disease is for the most part produced by violent inflammation. It is easily distinguished by those accustomed to an attentive examination of the eye; and it is particularly necessary for operators

tors to be well acquainted with it; for no operation, neither extraction nor deprefion, should be ever advised for it. The operation has never in any instance of this species of cataract been known to succeed; and for the most part, Mr Pellier observes, it is productive of very dreadful pain, and the most violent degree of inflammation that he ever met with. In general, too, the pain and inflammation thus induced remain fixed and permanent, without yielding in any degree to the remedies employed for it.

Cataracts are sometimes attended, too, with an imperforated iris; in which case, as no light can pass to the bottom of the eye, there is no degree of vision whatever; and at other times they are complicated with adhesions, either to the iris, or to the capsule of the vitreous humour. Preternatural adhesions of the lens to the capsule of the vitreous humour can scarcely be distinguished by the eye; but they are very commonly met with where the disease has been originally produced by, or



attended with, much inflammation; and they always render the operations of extraction and couching difficult. It is this kind of adhesion, Mr Pellier imagines, which prevents the operation of couching from succeeding so frequently as it otherwise might do; for when it takes place in any degree, the cataract, he supposes, will always rise again on the needle being removed from it.

In forming an opinion of cataracts from the seat of the disease, there are different circumstances which require attention.

1. It often happens, as we have already remarked, that the lens only is affected.—This variety of the disease is most frequent, Mr Pellier observes, in adults, and especially in old age.

2. When the opacity is seated in the capsule of the lens, if the anterior part of it only is diseased, it appears to be remarkably white, and to be placed very contiguous to the iris; while, on the contrary, if the posterior part of it only is affected, it is commonly of a grey colour, and the opacity appears to be deeply seated.

It

It sometimes happens, both after the operation of extraction and couching, that in the course of ten or twelve days, the capsule of the lens, which at first was perfectly found, becomes quite opake.—This variety of the disease Mr Pellier terms the *Cataracte Secondaire*.

3. When the body of the lens and its capsule are both opake, it commonly happens that the cataract is soft or even altogether fluid. In this case, much attention is necessary in the operation of extraction, to prevent the capsule from bursting: a degree of nicety, Mr Pellier observes, which those not much accustomed to this branch of practice can seldom arrive at, but which is very practicable with those who have had much experience in it.

4. In some instances cataracts appear to proceed from a partial affection of the lens, small opake spots being observed in it, while the rest of it remains found. In this case, vision is always most perfect in an obscure light when the pupil is most dilated.

In



In judging of cataracts from their consistence, there are three circumstances which more particularly require attention.

1. When a cataract is of a firm consistence, it is in almost every instance of a brown colour; it appears in general directly behind the iris, and not so deep as the lens is usually placed, and the pupil dilates and contracts very slowly.

2. When it is fluid, it is not commonly white, but rather of a cream colour, somewhat resembling purulent matter; and for the most part in this variety of the disease the globe of the eye appears full, and somewhat larger than usual.

3. It sometimes happens, Mr Pellier observes, that along with this fluid state of a cataract, the capsule is considerably thickened. To this he gives the appellation of the Cystic Cataract.

The colour of a cataract is another point of importance.

1. We have just observed, that a thin fluid cataract is for the most part of a  
cream

cream colour ; but in that variety of the disease which is observed in children at birth, although it is always fluid, the colour is almost always a milk-white. In general, however, at other periods of life, a white cataract is of a cheesy consistence.

2. When a cataract is of a yellow colour, a small portion of the lens commonly remains hard, the rest of it being dissolved into a thin transparent fluid, forming that variety of the disease usually termed the Hydatid Cataract.

3. Although a black cataract is not a common occurrence, Mr Pellier says he has met with different instances of it. The only disease for which it may be mistaken is the gutta serena ; but it may be distinguished from it by attention and observation. In the gutta serena the disease for the most part comes on suddenly, the pupil is of a deep black, it remains immovable in every degree of light, and the patient cannot distinguish colours or the clearest light from perfect darkness ; whereas, in the black cataract, the accession of  
blind-



blindness is commonly slow and gradual; the pupil contracts and dilates according to the degree of light to which it is exposed; the bottom of the eye is of a dark colour, but not of such a deep black as in the gutta serena; and the patient can distinguish light and vivid colours. In short, the symptoms of this variety of the disease are exactly the same with those of the common cataract; only, instead of being white, the opacity is black.

With respect to the maturity or ripeness of a cataract, Mr Pellier pays no regard either to the colour or consistence of the lens: He always considers the operation as proper, when the opacity has proceeded so far as to deprive the patient of sight, when it is not complicated with some other incurable disease, and when the habit of body is good. He always prefers the method of cure by extraction, excepting in a few cases where the pupil is extremely small, when he operates by depression. He always prepares his patients for the operation, by confining them to a  
low

low diet for five or six days; by giving two or three doses of salts and fenna; and when they are plethoric, he takes away ten or twelve ounces of blood.

In extracting the cataract, he makes the incision of the cornea in the ordinary place and of the usual size; but he has some peculiarities in his method of doing it.

Instead of placing his patient with his face opposite to a clear light, he seats him with his side towards it. If he is to operate upon the left eye, he uses his right hand, and the right side of the patient is placed towards the window. He always uses his left hand in operating upon the right eye; and in this case the patient is made to sit with his left side towards the light.

The patient being seated with the eye which is not to be operated upon tied down with a bandage, an assistant supports his head behind, while at the same time he fixes the eye with the speculum, fig. 5. Plate XXXIX. The figure represents the instrument of the full size. It is made of  
wire



wire; and it may either be of gold, silver, or any other metal. The head being fixed by pressing it against the breast with one hand under the chin, the assistant takes this instrument in the other; and placing the round curvature A upon the upper eye-lid immediately behind the tarsus or cartilage, he must by gentle gradual pressure fix the eye above, while the operator with the fore and middle fingers of his left hand, when the operation is to be done upon the left eye, must fix it below, at the same time that he draws down the under eye-lid. In using this speculum the upper eye-lid is forced almost entirely into the orbit, but it immediately returns to its natural situation on the instrument being withdrawn.

The eye being thus fixed, the knife fig. 1. Plate XXXIX. fixed in its handle, must be put into the operator's right hand, who now divides the cornea in the usual manner; but when the point of it comes opposite to the pupil, if the capsule of the lens is to be divided, Mr Pellier has arrived

rived at such dexterity in this operation, that he plunges the point of the knife through the pupil into the lens; and withdrawing it gently, he carries the point of it forward to the opposite side of the eye, and finishes the operation in the usual way. But in making the latter part of the incision, he is very attentive to the pressure made by the speculum, which he desires the assistant to remove entirely before the incision is completed, in order to prevent the vitreous humour from escaping.

This being done, the eye-lids are immediately shut; and while they are in this state, a slow, gradual pressure is made upon the eye-ball, with the flat end of the instrument termed a Curette, fig. 1. Plate XLII. which is placed immediately above the tarsus of the upper eye-lid. As the access of light to the eye is thus prevented, the pupil remains in a state of dilatation, by which the lens is more easily pressed out than it otherwise could be; and if the pressure be applied in a cautious  
man-



manner, no part of the vitreous humour is ever forced out.

When the cataract does not come out entire, which is sometimes the case, or when it is found to adhere to the contiguous parts, the end of the curette is introduced through the pupil, and with it any adhesions that occur are gradually separated; at the same time that any detached pieces of the lens are turned out through the opening in the cornea: Or, instead of the curette, the cistotome fig. 3. Plate XL. is sometimes employed for separating such adhesions.

In the course of this operation, it sometimes happens that the iris is forced too much forward into the anterior chamber of the eye, or even altogether through the incision in the cornea. With a view to prevent the bad effects which might result from this, Mr Pellier insinuates the flat side of the curette into the wound in the cornea, so as to press the iris into its natural situation.

This is the usual method in which Mr Pellier performs this operation; but circumstances

cumstances sometimes occur which require some peculiarity of management. The most material of which are these: When he has reason to conclude that the cataract is in a fluid state without any opacity of the capsule, instead of making an opening into the cornea of the usual size, he introduces a sharp-pointed knife, somewhat convex on the back, into the inferior part of the transparent cornea at a proper distance from the iris; and having made an incision of the tenth part of an inch in length, he pushes the point of the instrument upwards till it comes opposite to the pupil, when he carries it cautiously on till it reaches the lens; and having now made an opening in the capsule sufficiently large for discharging the fluid contained in it, he withdraws the instrument with the same caution with which it was introduced, and in this manner the operation is finished; as the cataract being in a state of fluidity, it passes easily off without any pressure.

When, again, along with a soft or fluid



cataract, there is reason to suppose that any part of the capsule is opaque, or even where the capsule alone is supposed to be diseased, he carefully avoids opening it or bursting it in the course of the operation: in either of these events, he says, it would be with difficulty extracted. He therefore, by slow gradual pressure with the curette, in the manner we have mentioned, forces out the lens, contained as he imagines, in its capsule or cyst; and he does it, he says, in every instance without forcing out any part of the vitreous humour. In some cases, however, he finds it necessary to introduce the end of the curette through the pupil, and to separate the capsule of the lens from the contiguous parts; but even this, he says, does no harm to any part of the eye. The importance of our being able to judge from the appearances of a cataract of the real state of the disease, is therefore sufficiently obvious, from the difference which this variety of it requires in the method of operating.

In extracting the cataract, it is a matter of  
of

of the highest moment to avoid the iris with the knife; but as this is extremely difficult in eyes that are not very prominent, in such cases Mr Pellier employs a knife with that side of it convex which passes next to the iris. One of these instruments is represented in Plate XXXIX. fig. 2. In every other respect it is the same with the knife which he uses in ordinary cases, represented in fig. 1. of the same plate.

In the course of this operation, it sometimes happens that the aqueous humour escapes in too great quantity before the point of the knife is carried across the eye so as to penetrate the opposite side of the cornea: When this takes place, which it often does when the hand of the operator is not perfectly steady, as the iris is apt to pass in before the point of the instrument, Mr Pellier advises the knife to be withdrawn, and the other knife, fig. 3. with a blunt or probe-point, to be introduced at the opening in the cornea; and the point being slowly carried over to the op-

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posite



posite side of the eye, an incision is there to be made, either with the other sharp-pointed knife or with a common lancet, sufficiently large for letting out the blunt point of the other ; when the operation is to be finished in the usual way, by pushing it forward and making a kind of semi-circular incision in the under part of the cornea.

As soon as the cataract is extracted, it is the common practice to present a watch or some other object to the patient, with a view to discover the success of the operation. In some instances Mr Pellier has been forced to consent to this, but he does not approve of it. Instead of this, he immediately closes the eye-lids, and covers each eye with a small bag of soft old linen or cotton about half filled with soft fine wool. These bags are applied dry, and are fixed with pins to a circular bandage of old linen passed round the forehead, which again is kept firm in its situation by a slip of the same linen made to pass beneath the chin and over the upper  
part

part of the head ; care being taken to fix them both with pins to the night-cap below.

The patient is now to be undressed, and with as little exertion as possible should be laid in bed, upon his back, with his head very little elevated; and in this situation he should remain with as little variation as possible during the first six or eight days, as it tends more than any other he can be placed in to a speedy cure of the wound in the cornea. In the course of a few hours after the operation, Mr Pellier always advises blood-letting to the extent of eight or ten ounces, excepting in low emaciated constitutions. The patient is kept upon a low diet. He gives an opiate; but prefers small doses frequently repeated, to the giving a large dose at once, which often produces sickness and vomiting, which should by all means be guarded against; for nothing so readily hurts the eye as the exertion of vomiting, coughing, and sneezing. For which reason he does not admit



of tobacco being used in any form, for the first eight or ten days.

The belly should be kept moderately open by gentle purgatives, and on the fourth or fifth day the dressings may be removed; and after clearing the eye of any matter that may have collected, and the eye-lid being cautiously lifted to examine the state of the wound, the same kind of bandage must be applied again. From this time forward the dressings should be renewed every second day, and in ten or twelve days from the operation the eye should be bathed before the new bandage is applied with a weak saturnine solution; but till this period warm milk and water is considered as preferable. About the end of the third week the bags of wool, after having been gradually lessened, may be taken away entirely, and a piece of green silk put over the eyes instead of them. If no interruption occurs to the cure, the diet may be made gradually better; and when one eye only has been operated upon, Mr Pellier commonly allows the patient to go  
abroad

abroad at the end of the fourth week, but never sooner; and even then the eyes are directed to be well covered: But when both eyes have been cut, he advises a confinement of at least six weeks.

This is the plan of treatment which Mr Pellier pursues in ordinary cases; and he attributes much of the success with which his operations are attended to a rigid observation of these regulations. But in some cases, where there is a particular tendency in the system to inflammation, remedies of a different kind are required.

The eye sometimes becomes so much inflamed even in the course of a few hours from the operation, that one blood-letting does not prove sufficient. In this case he advises leeches to be applied to the neighbourhood of the eye; and if a second or third general evacuation is necessary, he directs the blood to be taken from the foot, as by experience he finds this to prove more successful than when it is taken from the arm or neck. The patient is desired to drink plentifully of Arabic emulsion with a large proportion



of nitre. The pediluvium frequently repeated is supposed to prove very serviceable. And, for the removal of that violent pain which inflammation supervening to this operation commonly excites, nothing that has yet been tried, he thinks, answers so well as a liniment composed of the white of an egg and powdered alum beat for a considerable time together; a little of which should be applied to the eye every two hours between two plies of a bit of soft old linen. Besides affording relief from pain, it tends more effectually than any other remedy to stop the progress of inflammation; insomuch, that Mr Pellier employs it in every case as soon as the eye begins to inflame.

Instead of alum, he sometimes adds to the white of an egg three grains of white vitriol, and as much of saccharum Saturni dissolved in a spoonful of rose-water; and the whole being well beat together till it puts on the appearance of white froth, a little of this is inserted between the eyelids with a small pencil three or four times  
a-day,

a-day, at the same time that the eye-lids are covered with a small bag of thin linen in which some of it is contained. When the heat and pain attending the inflammation begin to abate, he advises a poultice composed of a ripe apple well boiled, with the water pressed out of it, and a small quantity of camphor and powdered saffron added to it.

By persevering duly in these means the inflammation is commonly at last removed. It is otherwise, however, in some instances: insomuch, that notwithstanding the utmost attention, every symptom is aggravated; the vessels of the tunica conjunctiva become extremely turgid; the eye-lids swell to a considerable size; and the pain, which before was severe, is now insupportable. In this situation, nothing has ever any effect in stopping the progress of the inflammation but local blood-letting carried to a proper extent by incisions made in the affected parts. For this purpose the mere division of the turgid vessels with a lancet or small scalpel sometimes answers; but



but in general it proves more successful to take away small portions from different parts of the internal surface of the eye-lids with small convex scissars, such as is represented in Plate XXXIX. fig. 4. This, Mr Pellier observes, seldom fails of giving immediate relief; and he has never afterwards found it produce any inconvenience. The state of the eye too being very critical, no remedy should be omitted that affords any chance of obviating the present danger; for if this be not quickly done, suppuration will soon take place either in the coats of the eye, or in one or both of the chambers.

When matter is evidently formed, a frequent use of warm emollient fomentations, applied particularly to the eye by means of a funnel of pasteboard, will sometimes produce a slow discharge of it at the incision in the cornea: but when this does not succeed in the space of eight and forty hours, no more time should be lost; the matter should be evacuated by an incision made in the most depending part of the abscess,

abscess, when it is seated in the substance of the cornea ; or, by opening the lips of the incisions made for extracting the cataract, when the collection is found to be in either of the chambers of the eye. By this means the patient will be immediately relieved from pain, while at the same time he will receive the only chance of preserving the use of his eye.

There is still another disagreeable occurrence to which patients are liable during the first two or three weeks after this operation, a kind of staphyloma, or herniary swelling, formed by the iris, or some other part, being forced out at the opening in the cornea, either by violent coughing, sneezing, or some other effort ; and in some instances, by exposing the eye too soon and too frequently before the cicatrix is sufficiently firm for resisting the pressure thus produced upon it. When the swelling which thus takes place is small, it may commonly be removed by touching it frequently with a small pencil dipped in Goulard's extract of lead, concentrated by evaporation,



poration, or in any mild antimonial escharotic : An attempt, Mr Pellier observes, that may be made with perfect safety, if care be taken to prevent the caustic from hurting the rest of the eye, by touching the diseased part only with it, and immersing the whole eye immediately in warm milk, or in some warm emollient decoction. But when the disease is farther advanced, and if it be of a firm solid nature, it answers better to remove the protruded part entirely either with the knife or the scissars ; or if it appears to be any part of the aqueous humour contained in a thin membranous production, as is sometimes the case, all that is in general found necessary is, to make an incision into it with a lancet of a size sufficient for discharging it. It is scarcely necessary to observe, that after either of these operations, the parts must be treated with much attention, otherwise, instead of proving serviceable, they may do harm. A strict antiphlogistic regimen must be observed. The eye should be lightly covered, either with a small bag, such

such as we have mentioned above, filled with soft wool, or with a compress of old linen soaked in a weak solution of saccharum Saturni.

Mr Pellier's method of extracting the cataract, which I have thus endeavoured to describe, with his treatment of the consequences which sometimes ensue from it, is the result of much experience, and usually proves more effectual than any other with which we are acquainted. Much of Mr Pellier's success undoubtedly proceeds from his superior dexterity in performing the operation; but much of it also depends upon the minute attention he pays to every case for a considerable time after the operation. In ordinary practice, and especially with the most part of itinerants, it is commonly supposed, if the operation be properly performed, and if the cataract comes away easily, that very little more is necessary on the part of the operator; but it is much otherwise with Mr Pellier, who considers the after treatment as so essential, that it is with difficulty he is ever prevailed

ed

ed upon to operate where he cannot have the subsequent management of the case for two or three weeks : And by constant and assiduous attention, he is often able to obviate symptoms which might otherwise prove alarming ; and which, in many instances, might even render operations abortive which would otherwise be attended with the most complete success. Of this I have seen different instances.

In a former part of this work, I entered into a full discussion of the respective merits of the two operations of couching and extracting the cataract ; and I then endeavoured to establish the preference of the former : But if experience shows, that Mr Pellier's method of operating is attended with more permanent advantages, I shall be very ready to retract my opinion ; for which purpose, I shall carefully attend to the consequences of those operations which he has performed in this country ; and as the public will probably be interested in them, I shall at some future period perhaps communicate the event of them.



There are two points of importance in this operation, with respect to which I differ in opinion from Mr Pellier. When he considers it as proper to divide the capsule of the lens, he frequently does it, as we have already observed, by insinuating through the pupil the point of the same knife with which he makes the incision of the cornea, even before the incision is completed.

This may possibly be done with safety in every instance by such a very dexterous operator as Mr Pellier : but as most practitioners, by imitating him, would run the risk of hurting the iris, the practice should not be encouraged ; for when the capsule of the lens is to be divided, it is surely better to do it after the incision of the cornea is finished, by lifting up the flap, and passing in the end of the blunt probe represented in Plate XXX. fig. 5. Vol. III. or of the cistatome, Plate XL. fig. 3.

The other point to which I allude respects the practicability of extracting the  
capsule

capsule of the lens, without doing any material injury to the eye.

When the cataract appears to be of a firm consistence, and when the disease is supposed to be confined entirely to the lens itself, Mr Pellier frequently opens the capsule in the manner I have just now described, with a view to allow of a more easy extraction of the lens; and in this case he admits that the capsule remains in the eye: But when he finds, after an operation, that the capsule of the lens becomes opaque, or if he observes that any part of it has been previously in a state of opacity, he advises it to be cautiously extracted with small forceps: And again, in every case where he suspects the cataract to be fluid, forming what he calls the Cystic or Hydatid Cataract, he avoids the division of the capsule, and advises the lens to be taken out included in it; which he says may be done in the manner we have mentioned, by making an equal and gradual pressure upon the ball of the eye immediately after the division of the cornea; or by separating

any adhesions which take place between the capsule of the lens and the contiguous parts, with the curette passed through the pupil.

I have not indeed seen Mr Pellier extract the capsule of the lens after removing the lens itself; for no cases requiring it occurred during his residence here: I received however full information of his method of doing it, by introducing small forceps at the pupil. But as I cannot imagine how this can be done without injuring the eye materially, I must still retain the opinion I formerly advanced of it, till I have evident proofs of its being practised with advantage\*: And whenever these are offered, I shall receive them with much satisfaction, as it would in many instances be a material improvement of this operation.

We have now to consider the possibility of extracting the capsule entire along with the lens: Several practitioners in this country had opportunities of seeing Mr Pellier ex-

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\* Vid. Vol. III. page 442.



tract cataracts, as they supposed, in this situation. I saw him operate in two instances of this kind, where he, as well as several others, imagined that the real capsule was taken out along with the lens; but as I entertain a different opinion on this subject, it is proper to state the reasons which have led me to adopt it.

1. The capsule of the vitreous humour, and that which contains the lens, are so intimately connected together, that it is difficult, or perhaps impossible, for the best anatomist to determine whether they are separate productions or not: At least they are so intimately connected, that they appear to be formed of the same substance, the crystalline lens being surrounded with a coat which seems to be a thin lamella of that which forms the capsule of the vitreous humour. The contrary, I know, has been alleged; but whoever will make the experiment, will find that the capsule of the lens has exactly the appearance which I have mentioned. It appears to be a production of the other; and they cannot be separated

separated without tearing or destroying some part of one or both of them : Now, if this is the case, when the contents of the eye are all laid open, and when all the assistance can be got that nice dissection affords, it appears to me impossible that they should be separated in the operation of extracting the cataract without injuring the rest of the eye, and particularly the vitreous humour, very materially.

2. In performing this part of the operation, viz. in attempting to extract the capsule of the lens entire, Mr Pellier does it by means which do not appear adequate to the intended effect. He does it, in most instances, by making a gradual equal pressure over the ball of the eye, and not by the introduction of forceps. Now it is difficult to conceive in what manner pressure applied to the eye can separate that intimate connection which certainly takes place between the capsule of the vitreous humour and that of the crystalline lens : By pressure they are frequently both forced out ; but no operator would wish to meet with

this, and no person guards more effectually against it than Mr Pellier, inasmuch, that the escape of the vitreous humour, or even of any part of it, is an occurrence he rarely meets with. In some cases indeed Mr Pellier insinuates his curette, as we have already remarked, through the pupil, with a view to detach the capsule of the lens from the contiguous parts: He allows however that this is not always necessary; and besides, there is much cause to suspect that the eye would often be hurt by it.

3. When it is found, as we have already observed, either during the operation of extracting the cataract, or afterwards, that the capsule of the lens is opaque, even Mr Pellier himself does not attempt to extract it by pressure. In this case he does it with forceps passed through the pupil. Now, if pressure answers in one variety of the disease, it ought probably to do so in others, so that the use of forceps should not be necessary; but it is only in the hydatid or soft cataract which Mr Pellier allows that this practice by pressure succeeds.

4. But



4. But as several practitioners, both here and elsewhere, have seen Mr Pellier extract the cataract, surrounded, as they imagined, with its proper capsule; and as he asserts with confidence, that it may be done merely by pressure; it will be asked, In what manner is this apparent contradiction to be explained? I can account for it only on the supposition of there being in all such cases, where this practice of extracting the capsule entire is considered as admissible, a preternatural formation of a new membrane within the capsule of the lens; which being of a firmer nature than the capsule itself, and probably very little, if at all, attached to the contiguous parts, we can easily see how it may be forced out entire, even by moderate pressure, and how easily bystanders may be deceived with it. When I first saw it done by Mr Pellier, as I had previously been informed that the whole capsule would be extracted along with the lens; as I had heard from very respectable authority that he had done it in different instances at Glasgow; and as I certainly

saw the crystalline pushed out, surrounded with a membranous bag, I must own that I was nearly converted to Mr Pellier's opinion: But on further consideration, the reasons I have mentioned against it appeared too conclusive, even for this weight of evidence to remove; and since that period, a circumstance has occurred, which with me puts the matter beyond a doubt. A cataract of a soft nature was extracted by Mr Pellier, surrounded with this membrane or bag quite entire. From the first I doubted much of its being the proper capsule of the lens, as it was said to be: for this tunic is well known to be exceedingly fine and delicate; whereas this was a membrane of a tolerable degree of firmness, which required some force to tear it. The patient however distinguished objects immediately after the operation; and what was then advanced concerning it could not be well refuted: But by some cause or other, possibly from the eye becoming inflamed, an opacity soon began to form in the old site of the crystalline,  
directly

directly behind the pupil, forming, to all appearance, a real cataract; and it now continues even after the inflammation is removed. Whatever explanation may be given of this by those who are inclined to support the contrary opinion, it proves to me a convincing proof, that some deception takes place in those cases where it is supposed the capsule is extracted entire along with the lens; for in this case, where the capsule was imagined to be taken entirely out, the opacity which succeeded, and which still exists, appears evidently to be seated in the capsule, and no where else. I therefore conclude, that where practitioners have imagined the capsule has been extracted entire, that they have been deceived by the lens being enveloped with a preternatural bag or cyst, formed perhaps by an inflammatory exudation from the internal surface of the capsule: That this production however is always formed in this manner, I will not positively assert; but in my opinion it is the most probable way by which we can account for it.



In this variety of cataract, however, it is certainly right to attempt the extraction of this membrane, for vision will not be perfect while it continues in the eye. But if I may venture to dissent from the opinion of one so versant in matters of this kind as Mr Pellier is, I would observe, that we should not, even in the most fluid cataract, endeavour to extract it without opening the capsule so as to discharge the contents of it: for as the cyst of which we have been speaking does not appear to be firmly attached to the neighbouring parts, it is probable it would be separated from them with as much ease when quite empty as when perfectly full, and it would in this state pass through the pupil with much less risk of hurting the iris; an object which we have elsewhere endeavoured to show is perhaps the most important of any in this operation.

These are the remarks I have to offer on Mr Pellier's theory and practice in the cataract. If farther observation shall convince me that I am wrong, I will readily  
acknow-

acknowledge my mistake ; but in the mean time, the reasons I have adduced appear to evince the impropriety of extracting the capsule piecemeal by means of forceps passed through the pupil, as well as the impossibility of making it pass entire along with the lens.

Mr Pellier's practice, as we have already observed, is not confined to the treatment of the cataract. He is equally accustomed to the management of every other disease to which the eyes are liable. In all of them he has acquired much useful experience ; but we shall confine our account of his practice to those points in which his improvements appear to be of most importance.

In the treatment of ophthalmia or inflammation of the eyes, whatever may be the cause of the disease, he condemns the use of emollients, and trusts entirely to remedies of an opposite nature. When the inflammation is violent, is of long duration, and does not yield to the usual means employed for it, he recommends a free division

vifion of the turgid vessels on the adnata ; and in order to do the operation effectually, he carries an incision round the whole globe of the eye, on that part of it where it appears to be most inflamed. The curved sharp-pointed knife, Plate XLI. fig. 5. he recommends as the best instrument for this operation. But with those not much accustomed to it, I believe it will be easier done with the knife delineated in Plate XXXI. fig. 3. Vol. III.

The scarifications being completed, the eye should be immediately bathed in warm milk and water, in order to promote as much as possible a free discharge of blood ; and this being done, he advises a little of the following ointment to be introduced on the end of a blunt probe between the eye-lids, to be repeated once or twice daily as long as the disease may continue, at the same time that a weak saturnine solution is employed morning and evening as a wash.

℞. Mercur. precip. rubr.

Lapid. calaman. pp<sup>tt</sup>. āā ʒiſs.

Lythar-



Lythargyrii pp<sup>tt</sup>. - ʒi.

Tutiæ pp<sup>tt</sup>. - 3fs.

Cinnab. nativ. - ʒi.

F. pulv. tenuissim. et misce cum axungia porcinae ʒii. et adde balsam. Peruviani gutt. xv.

This ointment Mr Pellier makes use of with much freedom and advantage in all diseases of the eyes that have either been induced by inflammation, or that happen to be attended with it; and he finds it particularly useful in those cases of Albugo or Leucoma where corrosive applications are admissible.

It sometimes happens in the small-pox, as well as in severe inflammatory affections of the eye, from whatever cause they may originate, that the centre of the cornea is left in a state of opacity, by matter forming between the coats of it. When this is not carried off by the remedies usually employed, if the iris, retina, and other parts of the eye appear to be sound, Mr Pellier advises an operation, from which he has in different instances derived much  
advan-

advantage. The centre of the cornea being opaque, the rays of light are thus prevented from passing to the bottom of the eye through the pupil; but when the sides or external border of the transparent cornea still remain clear and sound, light may be allowed to pass to the retina by enlarging the pupil; which, Mr Pellier says, may be done with safety by making an incision from one side of the iris to the other. And his method of doing it is this: He first makes an incision in the prominent part of the cornea, in the same manner as he extracts the cataract: He then inserts a small grooved director beneath the flap of the cornea through the pupil; and having passed it in a horizontal direction immediately behind the iris towards the outer angle of the eye, he now takes a pair of small curved scissors, and passing one of their blades along the groove of the director, he at once divides this part of the iris, when he withdraws the instruments and makes a similar incision on the opposite side of the eye. By this means, when  
the

the opacity is confined to the centre of the cornea, which is frequently the case, the rays of light which pass through the sides of it will now get access to the bottom of the eye, by the pupil being extended from one side of the iris to the other; and thus a degree of vision will be produced which could not otherwise be obtained. It will readily be imagined that perfect vision is not to be expected in this state of the eye; for a variety of reasons concur against it: but it is a matter of much importance for a person already totally blind to be rendered capable of finding his way, and of conducting himself from one place to another, which by this operation Mr Pellier has done in different instances; and, so far as I know, the public are indebted to him alone for proposing it.

After the operation, the eye must be tied up, and treated in the same manner and with the same attention as is done after the extraction of the cataract; for where so much violence is done to the eye,



if inflammation be not guarded against, much mischief may occur from it.

In describing the method of dividing the iris, we have said, that it should be done with the scissars; for this membrane being loose and unsupported, it would yield before the edge of the sharpest knife. In the introduction of the director and scissars, care should be taken, in passing them between the iris and lens, not to injure either the lens or its capsule; that is, when the disease is not complicated with a cataract; for when the crystalline is opaque, it should be extracted.

In the treatment of the fistula lachrymalis, Mr Pellier has much merit; for in the hands of most operators, it does not often happen in this disease that any permanent advantage is obtained from any of the remedies employed, and even they who are much accustomed to the management of it often fail entirely. Mr Pellier does not say, that he always succeeds; but he does so in most instances; and I know that his method

has often proved successful where others have failed.

In a confirmed fistula lachrymalis, the curative intention is, to form an opening between the lachrymal sac and the corresponding nostril. There are different methods of effecting this:—By searching with a blunt probe, to discover the natural passage; if this fails, by making an artificial opening through the os unguis; and when neither of these are ultimately found to succeed, by leaving a tube or canula, either in the natural or artificial opening, for the purpose of conducting the tears to the nose.

As we know from experience, that the operation fails in various instances, from the passage becoming again impervious, and this whether it may have been done by opening the natural passage or by forming another, it would be the idea perhaps of most practitioners to leave a tube in the opening, were it not liable to one very material objection, namely, the uncertainty of its continuing fixed in the situation in which  
it

it is at first placed ; for hitherto we have not been possessed of any certain method of preventing the canula either from rising and forcing its way out at the corner of the eye, or from passing down and coming out at the nose. In Plate XXXVII. Vol. III. I have already delineated various forms of tubes which have been used for this purpose ; and of these, figures 3. and 10. will in most cases, I believe, be found to answer: for when they are pressed sufficiently into the opening through the os unguis, the bulge or prominence with which they are furnished above, will for the most part prevent them from rising, while their conical shape will prevent them from passing into the nose. I must, however, acknowledge, that they sometimes fail; and that an invention of Mr Pellier's appears to be much superior to them. I know one instance in which it has hitherto answered completely, and eight months have elapsed since the operation. From the form of the tube, there is much reason to imagine it will answer; and Mr Pellier asserts, that  
when



when it is properly introduced it never fails. Two representations of it are given in Plate XLII. figures 5. and 6. It may be made either of gold or lead. Mr Pellier commonly employs lead: but when made of gold, the tube will not be so bulky if of the same strength; and as this metal receives a finer polish, by which the opening through it will not so readily fill up with the tears, it ought, I think, to be preferred.

The peculiarity of form of Mr Pellier's tubes consists in their having two projecting edges; one at the top, forming a kind of brim, corresponding as nearly as possible to the size of the lachrymal sac; and the other near to the middle between this and the other end of the instrument; by which means, when it is properly fixed in the passage where it is to remain, it is kept firm in its situation by the granulations which shoot out from the contiguous parts; and which, by grasping as it were that part of the tube which lies between the two edges, effectually prevent it from passing

either upwards or downwards ; and hence that material inconvenience is avoided which practitioners who employ cylindrical tubes always complain of.

It is necessary, however, to observe, that the utmost nicety is required in the use either of these or indeed of any other tubes ; in the first place, in adapting them with exactness to the size of the openings thro' which they are to pass ; and afterwards in the introducing them a proper length into the nose : For if a tube be either too small or too large for the opening through the os unguis, we may readily imagine that it will not answer ; and if it be pressed even a very little too far into the nostril, it will necessarily irritate the lining membrane of that cavity so as to create much pain and inconvenience. The tubes represented in Plate XLII. are of a size both in length and thickness which answer for the most part of adults, but practitioners should be provided with them of various sizes.

The method of using them is this. After laying the lachrymal sac freely open in the usual

usual way, the natural conduit of the tears is searched for, either with a firm probe, or with the conductor, Plate XLII. fig. 2.; and Mr Pellier asserts that he never fails in finding it. As soon as this is discovered, the tube must be put upon the conductor, previously furnished with the compressor, fig. 3. as in fig. 4.; and it should be of such a size that the conductor may fit it exactly in point of thickness, while the end of this instrument is so much longer as to pass through it about the tenth part of an inch. The point of the conductor is now to be insinuated into the lachrymal duct; and being pushed in till it reaches the nostril, which may be known either by inserting a probe into it, or by a few drops of blood being observed to fall from the nose, the conductor being no longer necessary, must be withdrawn, taking care to leave the compressor upon the upper brim or edge of the canula, which must be firmly pressed down with it in the left hand, while the conductor is removed with the other. If this precaution be not



attended to, the canula would be brought out along with the conductor; but this inconvenience is in this manner very effectually prevented, while the same instrument serves more easily than any other to press the canula to a sufficient depth in the lachrymal duct: a point of the first importance in the performing of this operation; for if the canula be not fixed with some degree of firmness even at the first attempt, there will afterwards be more pain and difficulty in doing it.

This being done, the compressor must next be taken out; and, with a view to discover whether the canula is at a proper depth or not, a little milk and water should be injected through it with the syringe, Plate XXXVII. fig. 1. If the injection passes freely and easily into the nostril, while the upper part of the canula is pressed down to the middle of the lachrymal sac, there will be no reason to doubt of its being properly placed: If, on the contrary, any obstruction occurs, there will be reason to suspect that it is already  
pushed.

pushed too far, and that it presses against the os spongiosum inferius; in which case the canula should be withdrawn, with a view to shorten it, when it must be again introduced in the manner we have mentioned.

As the wound recently made in the sac will yield a considerable quantity of matter, it is necessary to preserve it open for eight or ten days with a bit of soft lint spread with any emollient ointment, taking care to cover the whole with a compress of soft old linen, secured with a proper bandage. An injection of milk and water should be daily passed through the canula; and at the end of this time, or whenever the suppuration is much diminished, and the fore looking clean and healthy, the dossil of lint must be entirely removed; and a piece of court-plaster being laid over the fore, it may in this state be left to heal, care being taken to renew the plaster if any matter appears to form beneath it.

By this mode of treatment, cases of fistula lachrymalis, that do not depend up-

on diseased contiguous bones, or any latent disease of the constitution, will for the most part, as Mr Pellier observes, be completely cured in three weeks, nay sometimes in a fortnight, which by the usual practice might require three, four, or five months.

As I have been witness of the most complete success of Mr Pellier's practice in this disease, I have considered it as a point of justice, not only to Mr Pellier, but to the public, to give this full detail of it. Indeed, if I had not been convinced of the superior utility of Mr Pellier's practice, and of the unreserved manner in which he communicated his knowledge of the diseases of the eyes, I should have deemed it impertinent to have given the preceding account of either to the public.



## C H A P. XXVIII.

*Of the DISEASES of the NOSE and FAUCES.*

## S E C T I O N I.

*Anatomical Description of the NOSE and FAUCES.*

A MINUTE description of these parts is not necessary for our purpose; but a few remarks upon their general form and structure may serve in some measure to elucidate the nature of those diseases to which they are liable.

The external prominent part of the nose is chiefly composed of bones and cartila-

ges, which serve to protect the more deep-seated parts of the organ of smell, and to form a kind of vaulted passage for the air to the throat.

This passage, divided by the septum nasi, forms the nostrils, which extend almost in a horizontal direction from the superior part of the upper lip backwards to the pharynx, where they terminate above the velum pendulum palati.

The superior and lateral parts of the arch of the nose are formed by the nasal process of the os frontis,—by the two ossa nasi,—by the ossa unguis,—and by an extensive process from each of the ossa maxillaria, to which the cartilaginous alæ of the nose, covered by the common teguments, are immediately attached.

The septum narium is formed by the nasal process of the ethmoid bone,—by the vomer,—by the middle cartilage of the nose,—and by the spinous processes of the palate and maxillary bones.

The under part of the cavity of the nose is anteriorly bounded by a kind of horizontal

zontal process of the ossa maxillaria, and backwards by a process of a similar form, from each of the ossa palati. The sphenoid and ethmoid bones form the boundaries of the posterior part of the nares.

Towards the upper part of the nose, we meet with a very beautiful contrivance of nature for enlarging the organ of smell. In the superior part of each nostril, opposite to the septum, we find a spongy, cellular production of bone, proceeding from the os ethmoides, which, from their form, texture, and situation, are termed *Conchæ*, *Ossa Spongiosa*, or *Ossa Turbinata Superiora*: And beneath these, on the same side of the nostrils, are two bodies of a similar texture, which have likewise been supposed to be productions of the ethmoid bone, but of which there is no evidence. These, from their situation, are termed *Ossa Spongiosa Inferiora*. In some instances, two, and even three, small bones of this kind have been met with in each nostril; but this is not a frequent occurrence.

These bodies being prominent, and even  
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somewhat irregular on their surfaces, give the nostrils a winding, or even a crooked appearance: but every practitioner should know that they are so in appearance only; inasmuch that a common probe may be passed almost in a straight line from the external nares to the throat.

We meet with several openings which terminate in the nostrils, some of which it is material for surgeons to be acquainted with; viz. The ductus incisorii, which commence at the under and back part of the nostrils, and terminate behind the dentes incisivi of the upper jaw;—the sinuses of the sphenoid and frontal bones, which both open into the upper part of the nares;—the sinus of each maxillary bone, commonly termed the Antrum Maxillare, or Highmorianum, which opens into the nose between the upper and under ossa spongiosa of the same side;—and lastly, the ducts of the lachrymal sacs, which we have formerly had occasion to describe, and which terminate on each side immediately

diately beneath the os spongiosum inferius.

All the cavity of the nostrils; the different sinuses we have mentioned, as well as the passages leading to them; the whole surfaces of the ossa spongiosa, and even the fauces, are covered or lined with a thick, soft membrane, which, from its affording a plentiful secretion of mucus, is commonly termed *Membrana Pituitaria*, or *Membrana Schneideri*, from Schneider, the first anatomist who gave an accurate description of it.

This membrane appears to be a continuation of the cuticle. Towards the external nares, near to its connection with the epidermis, it is exceedingly thin; but as it proceeds backward upon the septum nasi and on the ossa spongiosa, it acquires a considerable degree of thickness; and again becomes thin as it proceeds to line the different sinuses.

The cavity of the nose, as we have already remarked, is separated from the mouth by a plate of bone, formed by a  
process

process from each of the ossa maxillaria, and by the ossa palati. To the posterior edge of the last-mentioned bone there is a firm membrane connected, termed the Velum or Valvula Palati, formed by a junction of the common membrane of the mouth, with a continuation of the membrana Schneideri, together with several muscular fasciculi, intended for the motion of this and the contiguous parts. This membrane, as it stretches back from the palate, falls down and terminates in the uvula immediately above the root of the tongue; by which it is not only well fitted for preventing the food, during mastication and deglutition, from passing up to the nose, but for conveying backwards to the pharynx all such parts of the mucus furnished by the membrane of the nose and contiguous sinuses as are not discharged by the external nares.

On each side of the throat, at the termination of the velum pendulum palati, there is situated a prominent glandular substance, commonly termed the Amygdalæ,  
or



or Almonds of the Ear. They are naturally of a soft, yielding texture; and in general they have excavations of different degrees of deepness on various parts of their external surfaces, which, by those not acquainted with the usual appearance of these parts, are often mistaken for ulcerations. On looking farther into the throat, along the course of the tongue, a thin, elastic, cartilaginous body is observed, termed Epiglottis, which is so placed as to prevent the food from falling into the trachea in its passage from the mouth to the pharynx, a wide capacious bag, which terminates in the œsophagus, and occupies all that part of the throat which is seen on looking into the mouth.

From this description it is evident, that the pharynx is furnished with several openings or outlets. Below, it terminates in the œsophagus;—anteriorly, it communicates directly with the mouth;—and from the superior part of the bag it has a free direct communication with the posterior openings of the nostrils.

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We shall now proceed to consider the diseases of the parts which we have described, and the operations which are practised in the treatment of them. The subjects to be treated of are,—Hemorrhagies from the Nostrils—Ozæna—Imperforated Nostrils—Polypous Excrescences in the Nose and Throat—Extirpation of the Amygdalæ and Uvula—and Scarifying and Fomenting the Throat.

## S E C T I O N II.

### *Of HEMORRHAGIES from the NOSTRILS.*

THE internal parts of the nose are supplied almost entirely with blood from the internal maxillary artery: And, in general, the branches of this artery which go to the nose are so extremely small, as to render a division or rupture of any of them an object of very little importance. In some instances, however, the reverse of

this takes place, and hemorrhagies occur from these parts which prove highly embarrassing to practitioners, and very hazardous to patients. They have sometimes even baffled every attempt that could be made to restrain them. However trifling, therefore, this evacuation may for the most part appear, it ought always to be treated with attention.

In a great proportion of cases of this kind, a proper application of cold proves very effectual in procuring a temporary stoppage of the discharge; and, in general, any future returns of it may be prevented by blood-letting, by a moderate use of cooling laxatives, and a low regimen.

In order to obtain all the advantages that may be derived from the application of cold, it must be employed in various ways, and to a considerable extent. The patient should be placed in a large apartment, with a current of cold air passing through it: His food and drink ought all to be cold: His face should be frequently bathed, and even immersed, in cold water,  
or



or in cold water with a proportion of vinegar: A strong solution of alum, or of any other astringent, should be used from time to time as a gargle: Compresses wet in any liquid of this kind should be applied over the nose: When in bed, he should be very lightly covered; and he should sleep with his head as high as possible.

By these means duly persisted in, nasal hemorrhagies may in general be removed; but in some instances no advantage whatever is derived from them, and the flow of blood is not in any degree diminished by the most exact application of them.

In such cases, compression of the ruptured blood-vessel is alone to be depended on; but when the part affected is deeply seated in the nostril, the application of pressure is both difficult and uncertain. It will sometimes happen, that a doffil of lint introduced into the bleeding nostril will put an immediate stop to the discharge. This, however, is a rare occurrence; for the extent and diameter of the passage through which the doffil must be

pushed being very unequal, the effect produced by it must likewise be so: From this circumstance, we cannot place much dependence on this method of applying pressure.

In a former part of this work, when treating of evacuations of blood from the anus in cases of piles, we advised the application of pressure, by the introduction of a piece of gut, tied at one end, into the rectum, and by filling it at the opposite extremity with any cold liquid, to increase the degree of pressure by forcing up the liquid and securing it with a ligature. The same remedy may be employed in hemorrhagies from the nose. It has already been successfully made use of in a few instances; and may frequently, we think, be employed with advantage. A piece of hog's-gut, that has been previously dried and moistened again, answers best. One end of it firmly tied with a bit of small packthread, should, by means of a probe or director, be pushed along the whole course of the nostril from which the blood is dis-

charged, to the upper part of the pharynx. The gut should now be filled with cold vinegar, water, or any other cold liquid, by means of a syringe inserted at the end hanging out at the nostril; and as much being injected as the gut will admit, the whole should be pressed as far up as possible, and should be secured in this situation by a firm ligature.

In this manner a very considerable degree of pressure may be applied; and some advantage may be derived from the application of cold directly to the vessel from whence the blood is discharged. In some instances, however, even this may be found to fail, owing to the ruptured vessel being so situated that pressure cannot in this manner be applied to it. In such circumstances, we must attempt by other means to put a stop to the hemorrhagy; and it may commonly be done in the following manner.

Let the curved instrument, *fi. 4. Plate XLIII.* be inserted at one of the nostrils with a piece of catgut or firm waxed thread  
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contained in it; and being conveyed into the throat, the ligature must be laid hold of with a pair of forceps, and taken out at the mouth, when the instrument is to be withdrawn and again introduced at the other nostril with a ligature of the same kind. . A bolster of soft lint, of a sufficient size for stuffing or filling up the posterior nares is now to be firmly tied to the two ends of the ligatures hanging out at the mouth, when the opposite ends of them must be pulled forward at the nostrils till the cushion of lint is firmly applied to and fixed in the upper part of the pharynx; when a compress of lint must be applied to each nostril, and fixed in this situation by tying the two ligatures over it. The patient should now be laid to rest. If the bolsters of lint have been properly applied, no blood will escape either from the posterior or anterior nares; any blood that is effused into the nostrils will soon coagulate, and thus a stop will be put to the hæmorrhagy. It is evident, however, that in order to insure success to this operation,

the bolsters of lint should not only be applied with much exactness, but ought to be continued for a length of time sufficient for admitting of the healing or reunion of the ruptured blood-vessels.

In fixing the bolster of lint in the back part of the mouth, we have advised two ligatures to be employed; one to be passed through each nostril. In this manner it may be applied not only more firmly, but more equally, than by the usual method of only one ligature passed through that nostril from whence the blood is discharged.

### SECTION III.

#### *Of an OZÆNA.*

THE term Ozæna has in general been applied to such ulcers of the nose as are foul, that discharge a fetid matter, and that are attended with a carious state of one or more of the bones; whilst by some the same general denomination of ozæna is applied to every ulcer in the nostrils, whether

whether attended with a caries or not.—At present we shall adhere to this last acceptance of the term.

Every catarrh affecting the lining membrane of the nose, is attended in a greater or lesser degree with an inflamed state of the parts immediately diseased. But we know, that in general this terminates easily, and that the inflammation is removed by a plentiful discharge either of mucus or of a thick yellow matter. In some instances, however, even after every other catarrhal symptom is removed, this discharge of matter continues obstinate, either from ulceration alone, or perhaps from ulceration conjoined with fulness and swelling of the soft parts within the nose.

Exposure to cold is to be considered as the most frequent cause of this state of the disease; but external violence of every kind that terminates in an inflamed state of the membrane of the nose, such as the application of acrid irritating substances, blows and bruises, &c. may likewise be productive of it.



When the system is not affected with any other disease, this is the most simple variety of an ozæna; and as in this state we suppose the affection to be perfectly local, local remedies ought alone to be recommended.

In this state of the disease, applications of a moderately drying and astringent nature are chiefly to be depended on. Of these, decoctions of walnut-tree leaves, of Peruvian or oak bark, mixed with a solution of alum, are perhaps equal if not preferable to any. Brandy or any other ardent spirits diluted with water, and lime-water, may likewise be employed with advantage.

Dossils of soft lint soaked in any of these should be introduced into the affected nostril three or four times daily, and should be pushed up as far as may be necessary for coming into contact with the affected parts; and every night at bed time an ointment should be applied, prepared with a considerable proportion of calcined zinc or of lapis calaminaris.

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By a due continuation of these means, every local affection depending on ulceration of the membrane of the nose will be at last removed. But instances have occurred of other diseases being mistaken for sores in the nose, and of the running produced by them continuing to resist every effort that could be made for its removal. This is particularly the case with collections of matter in the antrum maxillare.

In the anatomical description we have given of these parts, we have seen, that there is naturally a passage or opening from the antrum maxillare into the nose immediately below and covered by the os spongiosum inferius of the same side. In collections of matter in this cavity, when in considerable quantity, it is occasionally discharged by this outlet into the nose in every posture of the body, and almost always when the patient lies on the sound or opposite side. The method of treatment best suited for the removal of this affection will be the subject of a section in the ensuing chapter: At present we have

only to say, that in the treatment of diseases attended with a discharge of matter from the nose, practitioners ought to be on their guard, lest, by mistaking one disease for another, mischief may be done; not only by a misapplication of remedies, but by those means being omitted from whence alone any real advantage could be derived.

When, again, the matter discharged from an ulcer in the nose is thin, fetid, and of a brown or somewhat black colour, as there will be much cause to suspect from this that the contiguous bones are carious, it will be in vain to expect a cure till these are removed. We may in general be certain of the existence of caries merely by the peculiar fetor of the matter which such sores afford; but when any doubt remains of this, we have it commonly in our power to be determined with certainty by the introduction of a probe.

As a carious state of the bones of the nose occurs more frequently as a symptom  
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of lues venerea, than from any other cause, this ought to be kept in view in every affection of this nature : And whether we may be able to trace it with certainty as a symptom of this disease or not, whenever there is the least cause for suspicion, the patient ought, without hesitation, to be put upon a long continued course of mercury. Indeed, from whatever cause the disorder may arise, mercury will not probably do harm ; and as I have seen it prove serviceable even where there was no cause to suspect a venereal taint, I now in general make it a rule, in all such cases, to advise it immediately.

In the mean time, the local treatment of the sores should be particularly attended to. The parts should be bathed from time to time with one or other of the decoctions already mentioned ; and as the soft spongy bones of the nose are apt, when carious, to produce troublesome fungous excrescences, ointments, impregnated with corrosive applications, should be employed occasionally ; and of these there  
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are none I have ever tried that answer so well as prepared verdegris or red precipitate. There is a general prejudice indeed against the use of remedies of this kind in diseases of the internal parts of the nose, from a fear of their doing mischief, by irritating the very sensible membrane over which they are applied. There is no good cause, however, for this timidity; and I can say from experience, that ointments, such as I have mentioned, of a strength sufficient for keeping down the most part of fungous excrescences, may be employed with much safety, and without any risk of injuring the contiguous parts. It is scarcely necessary to remark, that in the use of remedies of this kind, some prudence and attention is requisite in adapting the strength of them to the parts to which they are to be applied. The internal surface of the nose will not bear the same degree of irritation that may with safety be applied to some other parts of the body; but it will bear the application of corrosive ointments more strongly impregnated than  
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is commonly imagined. A liniment composed of wax and oil, with an eighth or ninth part of red precipitate, or a smaller proportion of verdegris, may in general be employed with perfect safety, and the corrosive powers of it can be occasionally increased or diminished. The growth of fungous excrescences being thus prevented, and the sores being kept clean by the frequent use of an astringent antiseptic wash, the passage of the nostril will be preserved pervious, the disorder will not spread so readily, and at the same time the diseased bones will probably be more quickly separated and thrown off than when these circumstances are not duly attended to.

Till the caries is removed, no permanent cure can be expected. The treatment therefore which we have just recommended should be persisted in till this is fully accomplished. Indeed, after a sufficient quantity of mercury is exhibited for the removal of any latent venereal taint that might exist in the system, all that we can expect farther from art, is to assist in the manner  
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we have advised, in effecting a separation of such bones as are diseased. This being done, the fores will now be of a milder nature, and will in general heal by a continuance of the astringent applications we have already pointed out.

This is the practice which by experience I have found to prove the most successful in cases of ozæna. It must however be acknowledged, that no remedies with which we are acquainted can with certainty be depended on; and ulcers of this kind prove constantly extremely tedious, not only from the difficulty of reaching them with proper dressings, but from the ossa spongiosa, when they become carious, being always slow in exfoliating. When however the system is not otherwise diseased, the means we have mentioned, being persevered in, will very commonly accomplish our purpose.

S E C T.

## S E C T. IV.

*Of IMPERFORATED NOSTRILS.*

CHILDREN are not unfrequently born with the vagina or anus in an imperforated state; and although we know of no reason why the nostrils should not also be frequently imperforated, we are certain that it is a rare occurrence. Every practitioner, however, must have met with some instances of preternatural adhesions of the nostrils, the consequence of confluent small-pox, of burns, or venereal sores.

Obstructions of this kind are in various degrees. In some cases the nostrils are only slightly contracted, without producing any material impediment of the breathing. In others, they are so much drawn together, as hardly to admit a common probe or a small quill: And in a few, the passage is entirely obliterated.

In all such cases it is the object of surgery

gery to remove every preternatural obstruction; but as any operation for this purpose is productive both of pain and inconvenience, the assistance of art is not frequently desired. It ought undoubtedly, however, to be employed whenever the breathing is much obstructed, or when the deformity produced by the disease is considerable.

When an opening is left in the obstructed nostril, however small it may be, much assistance may be derived from it in effecting our intention. A small grooved director being inserted into it, the passage may be easily enlarged to its natural size, by running a small bistoury or scalpel into the groove in the course of the adhesion: But when no passage of this kind is discovered, whether the affection may be owing to a natural conformation, or to any other cause, we should, in the first place, by slow dissection with a small scalpel, endeavour to discover one of the nostrils, taking care, with as much caution as possible, to keep the opening in a proper direction



tion between the septum and the contiguous external cartilage: And the passage being once discovered, it must be enlarged to the natural size in the manner we have mentioned, by the introduction of a director and bistoury. This being accomplished in one nostril, we must endeavour, by the same kind of cautious dissection, to discover the other.

A clear opening being thus formed into each nostril, our next object is to endeavour to preserve them of a full size, and to prevent adhesions from forming in any part of them; which by experience we know are extremely apt to occur, and which can be prevented only by much attention.

The introduction of dossils of lint of an adequate size, or of any other soft substance, and retaining them till there is no risk of future adhesions, taking care however to withdraw them daily for the purpose of cleansing or renewing them, might no doubt answer our intention: but metallic tubes, adapted to the size of the openings,

ings, at the same time that they allow the patient to breathe with freedom through the nostrils, serve to distend the parts with more equality, and are more easily retained in their situation. Before being introduced, they should be covered with soft leather spread with any emollient ointment; by which they fit with more ease, and will be more readily withdrawn at the different dressings.

Various forms of tubes have been recommended for this purpose. Those represented in fig. 2. Plate XLIII. are of a form which will be found to answer perhaps equally well with any that have been proposed; and they may be retained either with a bandage round the head, or with adhesive plasters connected with them. They should be employed as long as any degree of soreness or excoriation is perceptible in the course of the incisions; for if they are withdrawn before the sores are completely healed, new adhesions or contractions will very certainly ensue.

It sometimes happens from burns, as

well as from the confluent small-pox, that along with a contraction, or perhaps a total obliteration, of one or both nostrils, an adhesion is produced between the nose and the skin of the upper lip. In this case the adhesion of the lip to the nose should, in the first place, be separated by slow dissection with a scalpel; and the sore thus produced should be perfectly healed and firmly cicatrised before any attempt is made to open the nostrils. It is scarcely necessary to remark, that, during the cure, the sore should not only be kept properly covered, but, with a view to remove any improper contraction which the lip may have acquired, it ought at each dressing to be tied down by several turns of a double-headed roller passed round and over the head.



## S E C T. V.

*Of POLYPI in the NOSE and THROAT.*

THE internal surface of the nose is liable to excrescences, which, from their form being supposed to resemble that of insects of this name, have commonly been termed Polypi. Every part of the nasal cavity, and of the back part of the throat, is liable to these excrescences; but most frequently they originate from that part of the membrane of the nose which lines or covers the ossa spongiosa. In general they are confined to one side of the nose, and they do not commonly appear so far back as the throat; but in some instances they occupy both nostrils, and in others they are so large as to be distinctly perceived on looking through the mouth into the pharynx. In some cases, indeed, they are found to originate from the pharynx.

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The first warning which a patient commonly receives of this disease, is a partial loss of smell, attended with a sensation of fulness or obstruction in some particular part of the nose, very similar to what is experienced from the stuffing of the nostrils in a common cold or catarrh. This continues to increase, till a small tumor or excrescence is perceived in one, and sometimes in both, nostrils; which in some instances never descends farther than to be merely perceptible when the head is somewhat elevated; while in others it falls a considerable way down upon the upper lip, and at the same time perhaps pushes back into the throat.

In some this elongation of the tumor continues steady and permanent, but in most instances the swelling retracts altogether within the nostrils in dry weather, and protrudes only in rain; and more especially in thick hazy weather. Indeed, the influence of weather on the size of these excrescences is often astonishing. I have known some patients who in clear

dry weather were not known to labour under the disease, in whom the swellings always protruded to a considerable length on the least tendency to a damp atmosphere.

Excrescences of this nature are of various degrees of firmness. A great proportion of them are soft and compressible, but in some instances they are extremely firm; and at last have been known to acquire even a cartilaginous kind of hardness. Both kinds of them are apt to bleed on being fretted or roughly handled; but it is those of a soft spongy nature only which are so remarkably affected by the weather, the firmer or fleshy kind of polypi being seldom or never influenced by it.

The colour of these excrescences is likewise variable: For the most part they are somewhat pale and transparent, but in some instances they are of a deep red colour; and, so far as I have yet had opportunities of observing, I would say, that there is some connection between the colour and consistence of them. The experience



rience of others may lead to a different conclusion ; but in the course of my observation it has uniformly happened, that the soft compressible polypus has been of a pale complexion, while those of a firmer texture have always been of a deep red.

In the commencement of this disorder, the pain attending it is always inconsiderable ; and in the softer kinds of it there is seldom much pain experienced from it, even in its most advanced stages. But those of a harder nature in general become painful as they increase in size, particularly on any cause of irritation being applied to them. In some instances, they become unequal and ulcerated over their whole extent. In this state, considerable quantities of a thin fetid matter are discharged ; and if a cure be not obtained by extirpation, they are now very apt to degenerate into cancer. It is proper to observe, however, that it is the firm fleshy kind of polypi only, which are apt to become cancerous, and that this change rarely

ly or never happens with those of a softer texture.

But although the softer kinds of these swellings very seldom terminate in cancer, and are rarely productive of much inconvenience in the early stages of the disease, or as long as the excrescences are confined to either of the nasal cavities ; in the latter stages of the disorder, they are often attended with a great deal of distress. Besides the trouble and perplexity which occurs from their falling down upon the lip, they sometimes pass so far back into the fauces, as not only to impede deglutition, but to obstruct respiration ; and in some instances the tumours become so very large, as not only to distend the softer parts of the nostrils, but to elevate and even to separate and dissolve the firm bones of the nose. This, indeed, is not a common occurrence ; but every practitioner must have met with it : I have seen different instances of it.

Various opinions are met with in authors of the cause of polypous excrescences.

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By some they are said to depend most frequently upon a scrophulous taint ; while others imagine, that a venereal infection often gives rise to them.

We will not say that swellings of this kind do not, in some instances, occur along with the venereal disease and scrophula. They may even be met with as symptoms of these diseases. But in such instances we would consider the general taint of the system in no other light than as an occasional or exciting cause of the local affection, for in almost every case of polypus a local injury may be traced as the cause of it ; and from every circumstance relating to the disease, we conclude, that it is always of a local and circumscribed nature. For even where a polypus originates from a venereal infection, this particular symptom is so far of a local nature, that it remains fixed and permanent after the general taint of the system is completely removed.

All the harder kinds of polypi we suppose may originate from the same causes



which produce tumors of a similar texture in other parts of the body ; but in most instances they appear to be connected with, and even to proceed from, a caries of the bone underneath ; and it is this chiefly which renders them more hazardous and much more difficult of cure than those of a softer nature, which, in general, we imagine are produced by a mere distention or relaxation of the membrana Schneideriana. When any portion of this membrane becomes inflamed, either by the effects of cold or from external violence, if in this state any part of its surface is ruptured or eroded, as frequently happens from picking or blowing the nose too forcibly, a degree of weakness or relaxation is thus produced, which is apt to terminate in a fulness or prominence of the parts immediately affected ; and this being increased by every succeeding cold, the disease we are now considering comes in this manner to take place.

The farther progress of the disease may depend on various causes ; but in general  
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it will advance quickly or slowly, according as the parts affected are more or less liable to inflammation. Thus I have known various instances of polypi of this kind remaining small and perfectly stationary for a great number of years, when the patients have not been obliged to be much exposed to the open air; while it commonly happens, among the poorer class of people, who are exposed to every inclemency of weather, and who are therefore more liable to frequent returns of catarrh, that the disease advances with much more rapidity.

In the treatment of every disease, it is a matter of much importance to be able to form a just prognosis, not only of the manner in which the symptoms may probably terminate, but of the effects to be expected from the different remedies that may be employed for them; and in no instance is this a more desirable object than in the management of polypous excrescences of the nose.

By some writers upon this subject, we are led to conclude, that polypi are always  
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of a doubtful nature with respect to the event or termination of them: That for the most part they are even of a dangerous nature; and therefore that we ought to consider every person in whom they occur as in a hazardous state: Whilst others assert, that although they may occasionally be productive of some inconvenience, yet that they are very rarely attended with any kind of risk.

Some, again, are so extremely timid with respect to polypi, as to suppose that they ought never to be meddled with; and allege, that there is more chance of doing harm than good by any operation we can employ for removing them; whilst by others we are told that they may be taken away with perfect safety.

This difference of opinion respecting the nature of polypi, and of the effects to be expected from the remedies employed for them, has arisen in a great measure from authors not having distinguished the different kinds of these excrescences with such precision as they ought to have done:

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For while in one variety of the disease there is little risk to be dreaded, and no great cause to doubt of our being able to remove it; in others there is undoubtedly a good deal of hazard, and much reason to fear that no remedies whatever will prove effectual in preventing a return of the swelling.

We have already observed, that tumors of this kind are met with of various degrees of consistence; and from all the experience which I have had in the treatment of them, I am led to conclude, that in general the risk with which they are attended is nearly in proportion to their firmness. The soft compressible kind of polypi are not only less painful than the others, but the removal of them may at any time be attempted with more safety. Indeed they are not commonly attended with pain; and it seldom happens that any material inconvenience occurs from the extirpation of them: But the firm fleshy kind of polypi are in general not only painful, but are much more apt to return after being extirpated.

pated. In forming an opinion, therefore, of the probable event of these tumors, this circumstance of texture deserves particular consideration. In a soft, yielding polypus, if the constitution is healthy, we may perhaps in every instance give a favourable prognosis: for, as long as the disease remains of a moderate size, there is seldom any inconvenience experienced from it, and therefore there is no necessity for meddling with it; and again, when, by acquiring a great additional bulk, the removal of the tumor is rendered necessary, it may always be undertaken with much probability of success. But, on the contrary, in polypi of a fleshy consistence, and especially in tumors of even a firmer texture than this, the patient or his friends ought always to be informed of the risk being considerable: for it frequently happens that excrescences of this kind cannot be entirely removed; and even when this is easily and completely practicable, they are very apt to regenerate, and in some instances, as we already observed, to become

become cancerous. In all such cases, therefore, a guarded prognosis ought to be given; otherwise, if the disease should afterwards return, the operator would be justly blameable, at the same time that the operation itself would fall into discredit.

Indeed some practitioners are so averse to this operation in all cases of firm or hard polypi, that they decline in every instance meddling with them. As long as they remain stationary, and are not attended with pain, if the breathing or deglutition are not obstructed by them, they ought not to be touched: But whenever they become painful, and especially when they have acquired such a bulk as to obstruct either the breathing or deglutition, we ought certainly to endeavour to extract them, if this be not already rendered impracticable by their adhering through the whole of their extent to the bones of the nose, and by these being rendered carious, which they are apt to be in the late stages of this disorder.

All the softer kinds of polypi which are liable,



liable, as we have already described to be affected by the state of the weather, may frequently be prevented from acquiring any additional bulk by the use of astringent applications, particularly by a strong solution of alum, a decoction of oak-bark, or the application of vinegar or ardent spirits. By one or other of these being applied from time to time over the surface of the tumors, I have known different instances of their continuing for a great length of time to give no kind of disturbance; and, in some cases where the remedy has been freely employed, they have even shrivelled and become considerably smaller. It must be acknowledged, however, that they have never accomplished a cure; but it is a matter of no small importance our being able by gentle means to render any painful operation unnecessary.

On the first appearance, therefore, of a polypus, we ought by a free use of some astringent application to endeavour to prevent its farther increase; but when these

are found to fail, we are to consider by what mode the tumor may be most effectually removed.

Various methods have been proposed for the removal of polypi;—namely, the use of caustic or corroding applications;—the actual cautery;—the passing of a seton or cord through the diseased nostril;—excision with a scalpel or scissors;—the application of a ligature round the neck of the tumor;—and evulsion or extraction by a proper application of the forceps.

An ignorance of the circulation of the blood, and of the easy method with which we are now acquainted of putting a stop to hemorrhagies, led in earlier times to the practice of removing tumors, wherever they were situated, by corrosive applications, and even by the use of the actual cautery. If this practice was considered as necessary in other parts of the body, it is not surprising to find it proposed for the removal of polypi in the nose, where the effects of hemorrhagies were more dreaded. Cauterising irons were therefore invented for this purpose, together with metallic

tallic tubes for conducting them. But even with the utmost attention there is no possibility of destroying the diseased parts without injuring those that are sound. Remedies of this kind are therefore more apt to do harm than to produce any advantage ; so that they are now very generally laid aside ; as are likewise all kinds of corroding applications, which are equally liable to uncertainty, by their being apt to spread to the contiguous sound parts in the cavity of the nose and throat.

As it has been imagined by some practitioners, that excrescences of this kind may be removed, by inducing a suppuration upon them, it has been proposed to insert a cord of silk or cotton into the diseased nostril, and one end of it being taken out at the mouth, by daily drawing it back and forward, and by covering that part of it which comes into contact with the tumor with a slightly irritating ointment, thus to create some degree of inflammation and consequent suppuration over it.



We will readily allow, that in this manner a plentiful flow of matter may be excited; but it is not probable that this can have much influence in diminishing the size of the tumor. Till of late indeed, it was commonly imagined that the formation of pus is always attended with a dissolution of the solid parts in which it occurs; and upon this principle Mr Daran and others have endeavoured to explain the operation of bougies in obstructions of the urethra; and a similar idea suggested the remedy of which we are now speaking, in polypous excrescences of the nose. But it is now known, as we have elsewhere fully shown, that the dissolution of solid parts is by no means necessary for forming pus. It is also known, that in diseases of the urethra, bougies prove effectual only by their form, and by the pressure which they produce; and we have no difficulty in saying, that it is in this manner only by which a cord, if it ever proves useful, can have any effect in removing polypi of the nose. As the passage of the nostrils is very une-

qual, being wider in one part than another, and as the roots of polypi are frequently so situated that no pressure can be applied to them; we are not of opinion that they can ever be removed by a cord passed through the nose, as many have imagined. But after the extirpation of polypi in the manner we shall afterwards point out, when the roots of them are not entirely removed, there can be no impropriety in our endeavouring in this manner to clear the passage more effectually. It was for this purpose solely, we may remark, that the practice we are now considering was originally proposed by that judicious observer Monsieur Le Dran. But although it might, in this manner, sometimes prove useful, as it is an application that must always prove troublesome and disagreeable, it has seldom been employed. We shall have occasion however in a subsequent part of this section, to enter farther upon the consideration of this point.

In other parts of the body, the removal of tumors by excision is universally preferred

red to every other method; and it ought likewise to be employed in polypi of the nose, were it not for their inaccessible situation. But it seldom happens that they are so situated as to render this mode of treatment practicable: for although scalpels and scissars of various forms have been invented for this purpose, the roots of polypi are in general seated so high in the nostrils, and the passage is for the most part so completely filled by the tumor itself, as to render it always difficult, and often impossible, to remove them by excision.

But when it is found that a tumor of this kind originates from the under part of the nostril, and when the point of a scalpel can be made to reach the root of it, we ought, without hesitation, to employ this method of taking it away, even in preference to that by ligature: for in this manner the whole of the tumor may be more effectually removed; and in this situation there is no reason to be afraid of hemorrhagies, as compression can be readily



applied to any blood-vessel that may be cut in the under part of the nostrils. We rarely find however, as has been already observed, that a polypus is seated so far down in the nostrils as to render this method of treatment practicable.

It therefore appears, that all the means we have yet considered for the removal of these excrescences are either inadequate for the effect, or altogether inadmissible; and hence we are under the necessity of employing either the method by ligature, or that by extraction with the forceps.

As the removal of a polypus, by tearing or twisting it off, is attended with much more pain than the application of a ligature round the neck of it, the latter would always have been preferred, if it had been considered as equally practicable. And as we now know that it can be done by means of a very easy and simple nature, it will probably be employed in future as the best method of removing every excrescence of this kind. The method we allude to, is that which Monsieur Levrette  
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of Paris first recommended, a considerable time ago, for the removal of polypi in the vagina, and which we now find may be used with equal propriety in similar affections of the nose and throat. The following is the method of applying it in polypi of the throat.

Fig. 1. Plate XLIV. represents a piece of pliable silver wire passed through a double canula, and the wire should be long enough when doubled as to pass through the nose into the pharynx. Let the wire be taken from the canula, and the doubled extremity *A* be slowly and gently insinuated through one of the nostrils; and as soon as it appears in the throat, the operator, with his fingers inserted into the mouth, must open the double sufficiently for passing it over the pendulous extremity of the tumor; and having pressed it down to the neck or root of it, the two ends of the ligature hanging out at the nostril, must be again passed through the canula; which is now to be inserted into the same nostril, and pushed back along the course of the

H 3      wire

wire till it comes into contact with the root of the polypus. The fingers should still be continued in the throat to preserve the ligature in a proper situation; and the canula being placed in the manner we have directed, the wire must be drawn tolerably tight; and the ends of it being fixed on the wings or handle of the canula, it must be left in this situation till the following day, when being again drawn somewhat tighter, and this being daily repeated, the tumor will fall off sooner or later according to the size of it. When the excrescence is small, it will probably drop in the course of the second day; and tumors of even a large size will come away on the third day. It is better however to make the compression in a more gradual manner; for when the wire is drawn with much force, instead of acting as a ligature, and removing the tumor by compression, it removes it too quickly, by cutting it across, and may thus be equally productive of hemorrhagies as if the operation had been done with a scalpel.

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In this manner all those polypi may be removed which either originate in the throat, or which proceed back from the nostrils into the fauces ; and the practice may be extended even to those which are very deeply seated in the pharynx, if the ligature can be properly applied over them either with the fingers or with the assistance of forceps, or an instrument such as is delineated in Plate XLVI. fig. 3. Some instances indeed have occurred of excrescences seated too far down in the œsophagus for admitting of ligatures being applied upon them in this manner ; nor is it admissible, even where the upper part of the tumor is accessible, if the base or neck of it is so low down as to prevent the ligature from being applied to it. In the third Volume of the *Physical and Literary Essays of Edinburgh* there is a case related, in which a very ingenious method was put in practice by the late Mr Dallas for surrounding the polypus with a ligature ; and although instances of such excrescences are extremely rare, yet as they are some-

times met with, I think it right to give a delineation of the instrument which in this instance was successfully employed.

In this case both the breathing and deglutition were much impeded by a large fleshy excrescence originating in the œsophagus, a considerable portion of which was thrown into the mouth by every exertion to vomit; but it soon retracted and remained perfectly concealed within the pharynx till vomiting or retching was again excited. This portion of the tumor which occasionally protruded, was entirely removed by the method we have mentioned, and which we have more particularly described in the explanation to Plate XLVII. By this means the patient was relieved from much inconvenience and distress; but another branch of the tumor which extended towards the stomach becoming afterwards very large, he died by the effects of it in about two years from the operation.

We think it right to remark, that this patient might probably have been saved  
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by the use of the ligature and double canula such as we have described, and that in similar cases it is to be considered as perhaps the best means of relief. When a polypus is suspected to have formed in the œsophagus, if no part of it is observed to protrude up towards the pharynx, there will be much cause to imagine that it proceeds down towards the stomach, so that if the double of a piece of flexible wire be pushed down the œsophagus, the pendulous part of the tumor may very probably be laid hold of in withdrawing it; or, if one attempt should fail, other trials may safely be made with it: And as soon as the double of the ligature is found to be firmly fixed, all that portion of the tumor which it surrounds may be easily removed by the application of the double canula in the manner we have mentioned. It is proper, however, to observe, that the ligature and canula should both be carried through one of the nostrils into the œsophagus; for in this manner they will not prove  
nearly



nearly so inconvenient as when passed through the mouth, and they may be applied with equal ease and advantage. For this purpose the canula must have a considerable degree of curvature, as is represented in Plate XLIV. fig. 2.

Ligatures may in general be applied round polypi of the back part of the nose and throat in the manner we have directed, without much interruption to the breathing; but when they are deeply seated in the œsophagus, and on all occasions when the application of the ligature is difficult and tedious, it is proper to secure an easy and free respiration during the operation by previously advising bronchotomy. By this no additional risk is incurred, for it may with ease and safety be accomplished; and it puts it in our power to finish the operation more perfectly than we otherwise could do. It is likewise proper to remark, that although the operation may often be done without any assistance from a speculum oris, yet whenever it proves  
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tedious, and when the ligature cannot be applied with much ease over the tumor, this instrument ought always to be employed.

We have now to mention the method of applying a ligature to a polypus seated in the anterior part of the nose, and which, instead of passing back into the pharynx, proceeds down one of the nostrils towards the upper-lip. Let the double of the ligature be passed over the most depending part of the polypus, and be slowly pushed up to the root of it with the slit probe Plate XLVI. fig. 2. The probe being given to an assistant to preserve the ligature in this situation, the two ends of it must be passed through a double canula; which being inserted into the nostril on the opposite side of the polypus, and being pushed easily along till it reaches the root of it, the ligature must now be drawn so tight as to make some impression on the root of the tumor, when the ends of it must be tied to the wings of the instrument, and must  
be

be daily pulled somewhat tighter till the tumor drops off.

In this manner every polypus forming in any part of the nose may be extirpated. Those who have not seen it put in practice may be apt to doubt of this assertion; but a few trials will show that it is not only the most effectual method, but the safest and easiest that has yet been proposed of removing every excrescence of this kind: And it has this advantage over every other method of applying ligatures upon polypi in the nose—it answers equally well in the large as in the smaller kinds of them—and it may even be applied where the tumor is so large as to distend the nostril to a considerable size. In Plate XLVI. fig. 1. there is delineated a remarkable form of a polypus extirpated in this manner under the direction of Dr Monro, who was the first, I must observe, who put in practice this method of removing polypi from the nose and fauces. This polypus filled the nostril completely; to such a degree indeed, that it could not have been removed  
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in any other manner; not even with forceps, for the blades of the instrument could not have been inserted.

Besides this, another method has been proposed of applying ligatures round polypi in the nostrils: By introducing a ligature through the affected nostril into the throat, and passing it in such a manner that the doubling may include the root of the polypus, if the opposite ends of it be taken out at the mouth they may be sufficiently twisted, it is alleged, for removing the tumor.

In a few cases this might possibly answer, but it would often fail: I think it right however to mention it, as it is recommended by a very judicious practitioner Mr Cheselden. Fig. 2. Plate XLV. exhibits a representation of a polypus surrounded with a ligature in this manner.

Various forms of forceps have been invented for the purpose of removing polypi. Those that answer the intention best, and that are most generally used, are represented in Plate XLVIII. Those of a  
straight

straight form are intended for extracting polypi by the anterior nares, and the crooked forceps are employed by some practitioners for the removal of those excrescences which pass into the throat behind the uvula. We have shown indeed that polypi of this kind may be more easily removed by ligature, but we think it right to delineate such forceps as are used by those who prefer a different method.

In proceeding to extract a polypus with forceps the patient ought to be firmly seated, with his head leaning back and supported by an assistant behind ; and as it is of much importance our being able to discover as nearly as possible the origin of the excrescence, some advantage may be obtained from the face being placed in such a manner that the light of a clear sun may fall into the nostril.

In the ordinary method of performing this operation, the surgeon now takes the forceps, fig. 2. Plate XLVIII. and inserting one of the blades on each side of the polypus, he carries them easily along till he  
I brings

brings their points as near as possible to the neck of it, when he lays hold of it firmly, and endeavours to extract it entire, either by pulling directly downwards, or by moving the forceps from one side of the nostril to another; or, as some more properly advise, by turning or twisting the polypus round till it is completely separated. By this last method I think it probable that the root or attachment of the excrescence will be more readily loosened than in any other way, at the same time that that part of the lining membrane of the nose will not be so much injured as when the tumor is tore away by being pulled either in a lateral direction or perpendicularly downwards.

When a polypus is of a tolerably firm texture, if the operation is properly conducted, we may frequently be able to bring it all away at once: but when it is very soft and yielding, it commonly requires repeated applications of the forceps; and we should never desist as long as any portion



tion of the excrescence remains which can with propriety be removed.

It is proper, however, in this place to observe, that the first application of the forceps is commonly attended with such a considerable discharge of blood, that beginners are very apt to desist before the operation is nearly finished, from their being afraid of fatal consequences from the hemorrhagy; but this ought not in general to be regarded, as long as by a farther use of the forceps we can extract any more of the polypus. And even when the operation is finished, if the patient is in any degree robust and plethoric, some advantage may be derived from our admitting of a farther discharge, by which inflammation may be prevented, which otherwise might be productive of troublesome consequences. The hemorrhagy, however, ought not to be allowed to proceed so far as to run any risk of hurting the patient. This, indeed, is not a frequent occurrence; for it does not so readily happen as is commonly imagined by those who

have not had frequent opportunities of seeing this operation put in practice. I will not pretend to say, that instances may not occur of more blood being lost by this operation than is proper ; but I can safely assert, that it is not a common occurrence. When it is found, however, that the hemorrhagy is proceeding too far, we ought immediately to employ those means which we know from experience are most effectual in putting a stop to it ; but as we have already treated fully of them in Section III. of this chapter, it is not necessary to enter upon them at present.

As it sometimes happens that some parts of the roots of the polypus are not extracted by the forceps, we are desired by some practitioners to destroy them by inserting caustic or corrosive applications into the nostrils immediately after the operation. Unless, however, we can evidently see the part on which the caustic should be applied, I am clearly of opinion that this practice should not be adopted ; for otherwise we must work entirely at random, and

will more probably do harm than be productive of any advantage. But when, by exposing the nostril to a clear light, we can bring the seat of the excrescence into view, we may with propriety touch any parts of it that remain with a piece of lunar caustic, properly covered with a canula in order to protect the contiguous sound parts. An instrument for this purpose is represented in fig. 1. Plate XLVII. This, however, should not be attempted on the day of the operation, as is commonly advised; for while any discharge of blood continues, we cannot obtain such a clear view of the parts affected as is necessary: But it may properly enough be done on the following day; and the application of the caustic should be repeated every second or third day as long as any remains of the polypus are observed.

When, again, the root of a polypus lies so deep that it cannot be discovered, if we find, either by the introduction of a probe, or by the breathing through this nostril not being sufficiently free, that the excrescence



cence is not entirely removed by the forceps, although, for the reasons mentioned above, we are averse in this situation to the application of caustic, it may be extremely proper to endeavour to destroy it by means of a more harmless nature. In this case, the practice we have already described, of passing a seton through the nostril into the throat might probably prove useful; but the same intention may be accomplished with more certainty by the use of a large bougie. We have already had occasion to remark, that in the removal of obstructions in the urethra, bougies seem to operate chiefly by mechanical pressure; and it appears to be highly probable, that upon the same principle they may be employed with advantage for the removal of those parts of polypous excrescences in the nostrils that we are not able to take away with the forceps. Nay more, were we consulted early in the disease, before the excrescence has acquired any considerable bulk, they might even, I think, be successfully employed in preventing their farther increase; and if

duly persisted in, they might perhaps, in some instances in this incipient state of the affection, remove them entirely. We are seldom, however, consulted in cases of this kind, as has been already remarked, till the disease has gone too far to admit of this practice. I have only had one opportunity of trying it; but in this case, the effects of it were such as to justify our putting it to the test of future experience.

The person in whom it was employed, had for several weeks complained of a kind of stuffing and interruption to breathing in one of his nostrils. On looking into it, I clearly saw, and touched with the probe, a small, pale coloured, soft polypus, at a considerable depth. As it did not yet produce much inconvenience, I did not think of advising it to be extracted; but considering it as a fit case for trying the effects of compression, a roll of bougie plaster of a proper size was introduced along the whole course of the nostril; and being gradually increased in size, the passage through the nostril became clear and pervious; and in  
the

the course of seven or eight weeks the excrescence disappeared almost entirely: but the patient was at this time obliged to go abroad, and I have not since heard of him.

In the latter part of the treatment of this patient a silver tube covered with plaster was employed; by which the breathing went freely on; and being of such a length as to pass entirely into the nostril, it was kept in with very little inconvenience. The tube may be prevented from falling out, or from passing back towards the throat, by a piece of adhesive plaster connected with it being applied to the upper lip, or by fixing it to a narrow roller made to go round the head.

In describing the operation, I proceeded upon the *idea* of the forceps in common use being to be employed; and when the excrescence is small, they answer the purpose as well as any other: But when the polypus is so large as nearly to fill the nostril, they cannot be either easily or properly applied; for the two blades of the forceps being both introduced at once,



they cannot but with much difficulty be pushed deep into the nostril already much obstructed; and the more they are pressed forward upon the excrescence, and the nearer that it is brought to the axis of the instrument, the more widely the blades of it are necessarily opened at their extremities; by which the tumor cannot be so equally compressed, nor is there such a chance of extirpating the root of it by means of them, as if they were so constructed as to apply pressure equally thro' their whole length.

To remedy these inconveniences, several improvements have been proposed; but the best I have met with is one by the very ingenious Dr Richter of Gottingen. A representation of it is given in Pl. XLVIII. fig. 3. This instrument may be used in the ordinary way by introducing both blades at once when the polypus is small; but when the tumor is large, it will always be found to answer better to introduce the blades in the same manner as we do midwifery forceps by inserting them separately.

One

One of the blades being carried slowly and cautiously forward along the course of the polypus, the other must in like manner be introduced at the opposite side of it, so that they may now be firmly locked together at the joint. The blades are accordingly made to separate easily, and to fix in such a manner as to admit of their being employed in the way we have directed.

These, and every other variety of forceps employed for this operation, ought to be as thin and slender in that part of them which is inserted into the nose as the nature of the disease will admit; for I must again observe, that the straitness of the part in which we have to operate, is one of the principal difficulties we have to encounter. But when the forceps are made of well-tempered steel, they need never be so thick and bulky as they are commonly made.

When, however, polypi have acquired a large size, the obstruction thereby produced in the nostril is in some instances to such a degree, that even with this and every other kind of attention there is no

possibility of inserting the forceps. In such circumstances, as a considerable space may be gained by laying the nostril open, it may in some instances be proper to divide the cartilaginous part of it by a longitudinal incision; and, after extracting the tumor, to reunite the divided parts either by adhesive plasters or with one or more sutures.

At the same time, however, that I mention this, I think it right to observe, that it is a measure which ought in no instance to be hastily adopted; but I also think, that it ought not to be universally condemned, as we find it to be by some practitioners. I do not imagine that it would in every case prove successful: but when a polypus has already become so large as entirely to fill the nostril; when therefore no forceps can be inserted for removing it; when the tumor is still continuing to increase; and when of course there is much reason to suspect that it may terminate fatally if it be not extracted; it will surely be better to give the patient



tient any small chance that may be derived from the practice we have mentioned, than to leave him to die in misery; which in all probability he would do were no attempt made for his relief. If on laying the nostril open, it is found that the tumor can be with safety removed with the forceps, a complete recovery may possibly be obtained; and thus the pain which the patient has suffered, and the trouble of the operator, will be amply rewarded, whilst at the same time no material injury will be done, nor no kind of risk incurred, if on laying the parts open it is discovered that no part of the tumor can with propriety be taken away.

In the firm fleshy kind of polypi, which in some instances degenerate into cancer, when it is found that the tumor is already ulcerated, and that the contiguous cartilages and bones of the nose are affected by it, it would no doubt be imprudent to advise the treatment we have mentioned, for no advantage would probably accrue from it; the patient would be made to suffer a  
great

great deal of unnecessary pain; and the operation itself would be brought into disrepute: but in the softer kinds of the disease, which rarely or never become cancerous, and when the more external bones and cartilages of the nose are not affected, we ought without hesitation to adopt it, when the tumor, as is here supposed to be the case, is meant to be removed with the forceps, and when this cannot be done in any other manner.

In the case of a firm fleshy excrescence, which filled the nostril so completely that the forceps could not be introduced for removing it, a method was put in practice by Dr Richter for diminishing the size of the tumor; which to a certain degree answered the purpose, and afforded considerable relief. A hole or opening was made through the centre of the excrescence by a common trocar, made red hot and covered with a canula, being pushed along the whole course of it. By this means a passage was formed through which the patient breathed easily, and the tumor was  
much

much lessened; but the Doctor was unfortunately prevented from attempting to complete the cure either by extraction or otherwise, by the patient leaving the place.— This case, however, affords an useful practical hint, and points out a mode of treatment which in tumors of this particular kind may in some instances be successfully employed\*.

I have thus described the method of extracting polypi of the nose with forceps; but I must again remark, that they may be removed both with more ease and safety with the ligature: and as this mode of operating is admissible in perhaps every case that can occur, it seems only to require to be more generally known to be very universally preferred. It was first put in practice under the direction of Dr Monro several years ago; and since that period I, as well as several others, have had different opportunities of employing it with success.

#### S E C T.

\* For a more particular account of this case, and of the forceps mentioned above, V. Augusti Gottlieb Richteri *Observationum Chirurgicarum fasciculus secundus*. Gottingæ, 1776.



## SECTION VI.

*Of Extirpation of the Tonsils.*

THE Amygdalæ or Tonsils are frequently, even in a natural state, so large as almost to fill up the passage from the mouth to the throat. As long, however, as they remain sound, and are not attacked with inflammation, any inconvenience produced by this is not commonly of much importance: but tonsils of this enlarged size are very apt to inflame on the patient being much exposed to cold; and frequent returns of inflammation are often attended with such an addition of bulk as to produce nearly a total obstruction to the passage of food, drink, and air.

It is this enlarged state of the amygdalæ which in general is termed a Scirrhoty of the Tonsils: but we think it right to observe, that the term Scirrhus appears here  
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to be very improperly applied; for, excepting the circumstance of a firm tumor, every other characteristic of scirrhus is in these affections of the tonsils very commonly wanting. A real scirrhus is attended with frequent shooting pains, and it is a swelling of such a nature as generally terminates in cancer: Now we know, that pain very seldom occurs in cases of enlarged tonsils, except from inflammation: while in an inflamed state, they are frequently indeed very painful; but as soon as the inflammation subsides, no more pain is experienced, and they remain perfectly easy till the patient is again exposed to cold. This, however, is never the case with swellings of the real scirrhus kind; for whenever they become painful, they uniformly proceed to turn worse: and, again, enlarged tonsils are seldom if ever known to terminate in cancer. I never knew an instance of their doing so; and few practitioners, I imagine, have met with it.

Mr Sharpe, when treating of this subject, recommends a more frequent extirpation

pation of enlarged, or what he terms Scirrhus Tonfils, than what has hitherto commonly prevailed; and he is induced to do so, from having observed that the disorder never returns, as it too frequently does after the extirpation of scirrhus tumors in other parts. His words being much in point, I shall transcribe them. "All other tumors of the scirrhus kind, whether of a scrophulous or cancerous nature, are subject to a relapse; the poison either remaining in the neighbourhood of the extirpated gland, or at least falling on some other gland of the body. In this case, I have never met with one such instance; and the patient has always been restored to perfect and lasting health \*."

Mr Sharpe has here communicated a very interesting fact; which is rendered the more valuable, by coming from a man of character, and whose practice was very extensive. By many, however, the truth of it has been doubted, from its being universally

\* V. Critical Inquiry, &c. by Samuel Sharpe.—  
Fourth Edition, section VII.



versally known that scirrhus tumors frequently return in other parts of the body after being extirpated. It would indeed be surprising to find the extirpation of scirrhus tonsils prove always successful when the same operation often fails when practised for similar affections in other parts. But the explanation we have given sets it in a more distinct point of view. These tumors of the amygdalæ, commonly termed Scirrhus Tonsils, are not of the true scirrhus nature; and hence it is that they never degenerate into cancer, or return after extirpation; and this is accordingly a very weighty argument for removing them as soon as they become so large as to impede either deglutition or respiration. Till this, however, takes place to a considerable degree, no practitioner ought to advise this operation; for, as it is attended with a good deal of pain, it ought to be avoided as long as the safety of the patient does not render it absolutely necessary; but whenever the tumor becomes so large as to produce much interruption to the passage of food and

4 air,

air, there should be no hesitation in recommending it.

Different methods have been recommended for removing enlarged tonsils.—Some advise the repeated application of the actual or potential cautery: Others recommend excision with the scalpel or with crooked scissors: And, lastly, it has been proposed to do the operation by ligature.

Caustic applications, however, are here altogether inadmissible, from the impossibility of using them without injury to the neighbouring parts; and we are debarred from the use of the knife and scissors by the profuse hemorrhagies which have sometimes occurred from excision. Necessity therefore obliges us to have recourse to the ligature; and with due attention we are able to remove every tumor by this method to which the amygdalæ are liable.

In the preceding section we have given a particular detail of the best method of applying ligatures to polypous excrescences of the throat, and it likewise appears to be the easiest and best method of forming

ligatures upon tumors of the amygdalæ. It ought to be done with pliable silver wire, but catgut of a proper strength will likewise answer; and although the double canula to be passed through the nose might be of a straight form, it will answer better if it is somewhat crooked, as in fig. 2. Plate XLIV.

The double of a ligature, formed of pliable silver wire or catgut, being inserted into one of the nostrils, must be pushed back till it reaches the throat, when the operator introducing his fingers at the mouth, must open the ligature; and having passed it over the tumor, it must now be pressed as much as possible down to the root of it. He must continue to preserve it in this situation with his fingers; while an assistant having inserted the two ends of the ligature into the canula, must push it easily along the nostril, till the farther end of it is either seen or felt in the throat; and the wire being now pulled so tight as to fix it in the substance of the tumor, the ends of it hanging out at the other extre-



mity of the canula must be tied in the manner we have formerly directed, to the wings or handle of the instrument; and the ligature being made tighter from time to time, the swelling will soon fall off.

The more pendulous the tumor, the more easily will the ligature be fixed. But however broad the base of it may be, there will seldom much difficulty occur with it: for the swelling is always very prominent; so that when the double of the wire is fairly passed over, it may be easily pushed down to the base with the fingers; and being preserved in this situation till it is once made sufficiently tight, it will not afterwards be in any danger of moving.

We have advised the ligature to be first carried through the nose before being put over the tumor. It might no doubt be inserted by the mouth; but in this manner much inconvenience would be experienced, by the ligature and canula hanging out at the mouth during the cure. This method, however, may be adopted when any difficulty occurs in the application of the

the ligature by the mode we have mentioned.

In affections of this nature, both tonsils are in general nearly equally enlarged: In some cases, the removal of one of them will form a sufficient opening for the passage of the food; but when it is found necessary to extirpate them both, it will be proper to allow any inflammation or tension that may have been induced by the first, to subside entirely before any attempt is made to remove the other.

The mode of applying a ligature upon tumors of this kind which I have just described, is in my opinion the best; but it may often be done in a different manner. Let a ligature of a sufficient strength be formed of waxed thread; and let this be carried round the tumor either with the fingers or with a split probe, such as is represented in Plate XLVI. fig. 3. A noose is now to be made upon it, and a knot of any degree of tightness may be formed on it by fixing one end of the thread at the side of the tumor in the throat with the

instrument, fig. 2. Plate LI. while the other is firmly drawn with the other hand of the surgeon out at the mouth.

This method was first put in practice by Mr Cheselden; and it has since that period been recommended by Mr Sharpe and others. In order to fix the ligature where the tumor is of a pyramidal form with a broad base, a needle with an eye near the point, such as is represented in Plate LI. fig. 3. was likewise proposed by Mr Cheselden. A double ligature being put into the eye of the needle, the instrument is now to be pushed through the centre of the tumor near to its base, and the threads being disengaged with a pair of forceps, the needle must be withdrawn. In this manner two ligatures are to be formed, each of them being made to comprehend one half of the tumor by one of the threads being tied above, and the other below.—The instrument, fig. 2. of the same Plate, is likewise necessary here.

Although it is proper to mention this method of fixing a ligature upon tumors  
of



of the tonsils with broad bases, it is not probable that it will be often found necessary. When the double canula is employed, it will never, I imagine, be needed, as by means of it such a degree of force can be applied as will at once fix the ligature in the substance of the swelling: And I am the more confident of this from finding Mr Sharpe of the same opinion, even when the operation was done in a manner by which the ligature could not be so firmly fixed as may be done with the double canula; but even when performed in this manner, Mr Sharpe observes, "that he has never in one instance found it necessary to employ the double ligature recommended by Mr Cheselden \*."

By whatever method, however, the operation is performed, it may in some instances happen that the tumor does not fall off by the first ligature; in which case another must be applied, and continued till the cure is completed.

K 3      S E C.

\* Vide Mr Sharpe's Treatise on the Operations of Surgery, chap. xxxii.

## SECTION VII.

*Of the Extirpation of the Uvula.*

THE uvula, by frequent attacks of inflammation, as likewise perhaps from other causes, becomes in many instances so relaxed and elongated as to be productive of much distress, not only by impeding deglutition, but by irritating the throat so as to induce cough, retching, and even vomiting.

Any slight degree of enlargement of this part may in general be removed by the frequent use of astringent gargles, composed of strong infusions of red rose leaves—of Peruvian bark—or of oak-bark, with a due proportion of alum or of the vitriolic acid: And as long as remedies of this kind are found to prove effectual, no other ought to be advised. But when these fail, and when the tumefaction of the uvula is so considerable as to create much uneasiness

ness in the throat, along with any of the forementioned symptoms, we must depend on extirpation alone for the removal of them.

The uvula may be extirpated either by excision or by ligature. By the first, the parts affected are quickly removed, and the patient obtains immediate relief; whereas the other is more slow in effecting the same purpose, and is applied with difficulty. But by excision troublesome hemorrhagies sometimes occur, while no risk whatever ensues from the use of a ligature. Some practitioners indeed allege, that no danger can ensue from any hemorrhagy that may take place in consequence of the excision of the uvula; but although this may in general be the case, yet I know from experience that instances of the contrary sometimes occur, and that very considerable quantities of blood have been lost by this operation. This will most readily happen where the uvula is much enlarged, and where of consequence the vessels with which it is supplied are in an



enlarged state. Where the uvula is merely elongated, there will seldom, I imagine, be any risk of removing it by excision. In this state, therefore, of the disease, excision should be always employed; but when the parts to be removed are much increased in bulk, it will be better to make use of the ligature.

Different instruments have been invented for cutting off the uvula. One of these, which has been most frequently used, is represented in Plate LII. fig. 1. But neither this nor any other we have met with answers the purpose so well as a curved probe-pointed bistoury, such as is delineated in fig. 3. of the same Plate. Or the operation may be very easily done with a pair of scissars of the common form, or with a curve, such as is represented in Plate XLIX. fig. 1. 2. or 3.

When any of these instruments are to be employed, the mouth should be secured with a speculum oris, such as is represented in Plate LIV. fig. 1.; and the uvula should be laid hold of with a pair of small  
forceps,

forceps, or with a sharp hook, by which it will be more easily cut off than if it were left hanging loose in its natural situation. After the operation, if much blood is discharged, it may be restrained by the use of an astringent gargle, by the application of ardent spirits, or even by touching the bleeding vessel with lunar caustic. It will seldom happen, however, that any precaution of this kind is necessary; for a moderate flow of blood will never do harm, and more than this will rarely occur where the parts are not much enlarged. When, again, the ligature is to be employed, the mode of fixing it described in the last section may also be adopted here: It may be done by the double canula passed through one of the nostrils;—or the canula may be introduced at the mouth;—or it may be done by the method employed by Mr Cheselden for applying ligatures upon the tonsils, which is likewise described in the last section. After passing the ligature round the tumor, which in general will be easiest done with  
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the fingers, a knot may be tied upon it in the manner we have there directed, with the instrument, fig. 2. Plate LI.

I have likewise thought it right to represent another instrument, which hitherto has been almost the only one employed for fixing a ligature upon the uvula, Plate XLIV. fig. 3. From the name of the inventor, it has commonly been termed the Ring of Hildanus. The invention is very ingenious; and by means of it a ligature may be firmly applied upon the uvula: but the same intention may be accomplished in a more simple manner by either of the other methods that I have described; so that this will probably be laid aside.

## SECTION VIII.

### *Of Scarifying and Fomenting the Throat.*

**I**T frequently happens in inflammatory affections of the amygdalæ and other contiguous parts, that scarifications are found  
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necessary ; in the first place, for lessening the degree of inflammation, by inducing a topical discharge of blood ; and afterwards for the discharge of matter contained in abscesses, when suppuration has not been prevented by the means usually employed for this purpose.

In Volume II. Plate XXIV. I have delineated an instrument for this purpose ; and other two of different forms are represented in Plate LIII. figures 1. and 3. The wings with which fig. 1. is furnished are particularly well adapted for compressing the tongue, while the scarificator is employed in the back part of the mouth. By either of these, as well as with the other, in Plate XXIV. scarifications may be made, or abscesses may be opened, in any part of the mouth or throat with perfect safety.

In the treatment of inflammatory affections of these parts, we often find it necessary to recommend fomentations ; a remedy, too, which proves frequently highly serviceable in catarrhal affections of the  
trachea

trachea and lungs. Various methods are proposed for conveying warm steams to these parts; but the best we have ever seen, and it is likewise the neatest and most simple in its construction, is the instrument delineated in Plate LIII. fig. 2. the invention of Mr Mudge of Plymouth. By means of it, the throat, trachea, and lungs, may be very effectually fomented by drawing warm steams into them, and without any difficulty or inconvenience to the patient, who may lie in bed during the whole operation.—This instrument I consider as so highly useful in the treatment of every case of catarrh, that I think every family should be possessed of it.

## CHAPTER XXIX.

*Of DISEASES of the LIPS.*

## SECTION I.

*Of the HARE-LIP.*

**N**ATURAL deficiencies are not so frequently met with in any part of the body as in the lips. Children are often born with fissures in one of the lips, particularly in the upper lip. In some instances this is attended with a considerable want or real deficiency of parts; in others  
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we only meet with a simple fissure or division of them; whilst in some, again, there is a double fissure with an intermediate space left entire between them. Every degree of this affection is termed a Hare-lip, from a resemblance it is supposed to bear to the lip of that animal.

For the most part this fissure or opening is entirely confined to the lip itself: but in many instances it is found to extend backward along the whole course of the palate, through the velum pendulum and uvula into the throat; and in many of these the bones of the palate are either altogether or in part wanting, while in others they are only divided or separated from one another.

Every degree of the hare-lip is attended with much deformity. It sometimes prevents a child from sucking. When in the under lip, which is not, however, often met with, it is commonly attended with inability to retain the saliva, and it is always productive of some degree of impediment of the speech; and when the divi-

sion extends along the bones of the palate, the patient is much incommoded both in chewing and swallowing, by the food passing readily up to the nose.

These are all very urgent reasons for our attempting a cure of this affection as early as possible. Indeed, when sucking is interrupted by it, the child must either be fed by the spoon, or the operation must be done immediately. By practitioners in general we are desired at all events to delay it to the third, fourth, or fifth year; on the supposition, that the crying of the child will either render it altogether impracticable, or that the means employed for obtaining a cure will be thereby rendered abortive.

This reason, however, does not appear to be of much importance; for till the child arrives at his twelfth or fourteenth year, when we may suppose him to be possessed of sufficient fortitude for submitting easily to the operation, the same objection will be found to hold equally strong: Nay, a child of six or eight years of age is  
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in every respect more difficult to manage than one of six, eight, or twelve months. I am therefore clearly of opinion, that in a healthy child the operation should never be long delayed; for the more early it is performed, the sooner will all the inconveniences produced by the disease be obviated: and so far as I can judge from my own experience, I think that it may be done even in very early periods of infancy, perhaps in the third or fourth month, with the same prospect of success as in any period of life. I have done it in the third month with very complete success.

Practitioners all agree with respect to the intention of this operation, which is accomplished by cutting off the sides of the fissure so as to reduce it to the state of a recent wound through the whole extent of it; and this being done, the sides of the newly divided parts are drawn together and retained in contact till a firm adhesion takes place between them. But although the principles on which our practice is founded are universally admitted, authors



have entertained very opposite opinions of the best method of carrying it into execution. By some we are directed to employ the interrupted future for retaining the sides of the fissure: others prefer the twisted future: whilst by many, futures of every kind are said to be improper; and that a cure may be always obtained by the use of adhesive plasters, or by proper bandages; by which means a great deal of pain, they allege, may be prevented, which futures are always sure to occasion.

This is a point of much importance, and therefore merits particular discussion; and more especially as it has been warmly contested even by surgeons of reputation.

In the treatment of every disorder, it is our principal object to obtain an effectual cure; but every practitioner will allow, that the easiest mode of effecting this ought always to be preferred. On this principle much pains have been taken to shew, that futures are seldom necessary in wounds of any kind, especially in the treatment of the hare-lip; and in support of this opinion

various cases are recited of cures being effected with bandages alone: Nay some have gone so far as to assert, that in every instance of hare-lip a cure may be accomplished with more certainty by means of a proper bandage than when futures are employed; for they allege, that the irritation produced by futures serves in a great measure to counteract the very purpose for which they are intended. After the edges of the fissure are cut off or rendered raw, the contraction of the adjoining muscles is the only difficulty which we have to encounter: and this, we are told, instead of being removed by futures, is universally increased by them; while the same intention, it is said, may be effectually accomplished without any inconvenience whatever, by a bandage applied in such a manner as to keep the parts intended to be united in close contact, which it does by supporting the contiguous parts so as to prevent the reaction of the muscles connected with them.

That a hare-lip may be as completely  
cured

cured with the uniting bandage, or with adhesive plasters properly applied, as by futures, we have no reason to doubt; and as this method of treatment is attended with less pain than the other, it ought in every case to be preferred if it could be relied on with equal certainty: But although by this means we might with much pains and attention be able in many instances to accomplish a cure, yet from the nature of the remedy there is much reason to imagine that it would very frequently fail; for in the cure of the hare-lip, if every point of the parts intended to be united be not kept in close contact till a complete adhesion takes place, our intention is always frustrated, and nothing will afterwards prove successful but a repetition of the operation in all its parts. The edges of the fore must be again rendered raw, and the patient must submit either to another application of the bandage, or to the use of futures; which, if employed at first, might have saved much trouble both to himself and to the operator: For it is pro-



per to observe, that in cases where the operation is applicable, the method of cure by futures, when rightly conducted, never fails, at least I have never known an instance of it. It sometimes happens, indeed, that the deficiency or retraction of parts is so great as to render it impossible by any means to keep them in contact; and if futures are employed in cases of this kind, they will no doubt prove unsuccessful: This, however, is not the fault of the remedy, but of the operator, in using them in an incurable variety of the disease.

As I have had often occasion to put this operation in practice, and being at first prepossessed in favour of the method of cure by bandages and plasters, I gave them both a fair trial; and the result was what I have mentioned. I found, that by this method a complete cure might in some instances be obtained, but that the greatest care and attention could not insure success; and finding that disappointments never occurred from the use of futures when  
they

they are properly employed, I have now laid every other method aside; and hitherto I have had no cause to regret my having done so. I shall therefore proceed to describe the operation as it is performed when futures are employed; and as none of the methods of treatment by bandages will ever probably be received into general use, it would be considered as superfluous to give an account of them: And besides, our doing so seems to be altogether unnecessary, as the subject has already been fully treated of by various authors of reputation, particularly by Monsieur Louis of Paris, who has given a paper in the 4th Volume of the Memoires of the Royal Academy of Surgery, which contains every argument that has been suggested in favour of the method of curing the hare-lip by means of bandages.

In proceeding to the operation, the patient, if an adult, should be seated opposite to the light, with his head properly supported by an assistant behind; but if a child, he will be more firmly secured by being

laid upon a table, and kept in a proper posture by an assistant standing on each side.

The operator is now to make an attentive examination, not only of the parts to be removed, but of those to which they are contiguous. The upper lip ought to be completely separated from the gums beneath, by dividing the frenum which conjoins them. This admits of the lip being more equally stretched; and when one of the fore-teeth is found opposite to the fissure, if it projects in any degree, as is sometimes the case, it ought to be taken out, as it will irritate and stretch the parts if it is allowed to remain. In some instances too, especially when the fissure runs through the bones of the palate, a small portion or corner of bone is found to project from one or both of the angles. This ought likewise to be removed; and it may be easily done by the pliers or forceps, which ought to be both firm and sharp, as is represented in Plate LVI. fig. 2.

These preparatory steps being finished, the surgeon, standing on one side of the patient,



tient, must take one side of the lip between the thumb and fore-finger of his left hand; and desiring an assistant to do the same with the opposite side, and to stretch it somewhat tightly, he must, with a common scalpel, make an incision from the under boarder of the lip up to the superior part of it; in which he must take care to include not only all the parts immediately concerned in the fissure, but even a small portion of the contiguous sound skin and parts beneath: And this being done on one side, a similar incision must be made on the opposite side; which ought to be of the same length with the other, terminating in the same point in the upper part of the lip. By this means, if the operation is rightly done, a piece including the fissure completely will be cut out, of the form of the letter V inverted; and the deficiency will in every part of it have the appearance of a recent wound.

With a view to prevent inflammation, the divided arteries should be allowed to discharge freely, especially if the patient is

plethoric; and this being done, the surgeon is to proceed to unite the sides of the fissure. In this he will be much assisted by desiring the cheeks to be pushed forward so as to bring the edges of the wound nearly into contact, although not altogether so close as to prevent him from seeing freely through from one side of it to the other; and the assistant behind should be directed to support the parts in this situation during the remaining steps of the operation.

The surgeon is now to see that the two sides of the cut correspond exactly with each other; and this being done, the pins intended to support them must be introduced in the same manner as we have directed in describing the twisted future, Vol. I. Chap. I. Sect. V. The first pin ought to be near to the under edge of the lip: If possible indeed, it should be placed entirely within the red part of the lip, leaving no more space beneath than is merely necessary to support it. Another pin must be inserted in the centre of the cut, and a third within a very little of the superior

terior angle of it. By some we are advised to use a greater number of pins; but even in adults three are always sufficient, and in infants two will very commonly answer. In passing them, they ought to be made to enter nearly half an inch from the edge of the fore; and being carried nearly to the bottom, which will be seen by retaining the wound open in the manner we have directed, they must be again passed outward in a similar direction and to an equal distance on the opposite side of the fissure.

The assistant should now be desired to push forward the cheeks, so as to bring the edges of the fore close together, when a firm waxed ligature should be applied over the pins in the manner we have formerly directed for the twisted future, and as will perhaps be better understood by fig. 3. Plate LVII. The surgeon should first apply the ligature to the under pin; and having made three or four turns with it, so as to describe the figure of 8, it should then be carried to the contiguous pin; and  
being



being in a similar manner carried round it, he is then to finish the operation by carrying it to the other; taking care in applying it round all of them, to draw it of such a tightness as may retain the parts in very close contact; but not so strait as to irritate or inflame them, as is sometimes done.

By some authors we are desired to make use of a separate thread for every pin, in order, as they say, to admit of one pin being removed, if it should become necessary, without disturbing the others. This however never happens to be the case; so that the precaution is altogether unnecessary.

A piece of lint, covered with mucilage to retain it, should now be put over the course of the cut, with a view to protect it more effectually from the air; and it should likewise be made to cover the ends of the pins to prevent them from being entangled with the bed clothes, or otherwise; and this is all the dressing or bandage which in general is necessary. We are desired indeed by many, after the pins are  
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are all secured, to apply the uniting bandage, in order to support the muscles of the cheek, so as to prevent the pins from cutting or irritating the parts through which they are passed, which they are apt in some degree to do, when the deficiency of parts produced by the disease is considerable.

This however is a practice which I have never observed to prove in any degree useful, and it often does mischief; for a bandage cannot be applied with such tightness as to give any support to the muscles of the cheek without incommoding the patient exceedingly: and it is apt to do harm, as we have elsewhere observed, by pressing upon the ends of the pins over which it must pass; for even allowing a slit to be made in that part of the bandage corresponding to the lip, as some have advised, this inconvenience of its pressing upon the pins cannot be altogether prevented: And besides, although a bandage may be applied sufficiently tight at first, the motion of the jaw commonly loosens it

it soon, so as to prevent it from having any farther effect. When, however, there is a great deficiency of parts, and when the edges of the sore are with difficulty brought together, some advantage may be derived from a proper application of adhesive plasters. An oblong piece of leather, spread either with common glue, or with a strong mucilage, such as is employed in making the court plaster, being applied over each cheek, and of a size sufficient for reaching from the angle of the jaw to within an inch or thereby of the pins on each side, and each piece of leather having three firm ligatures fixed to that end of it next the pins, one at each corner and another in the middle, the cheeks should now be supported by an assistant, when the ligatures should be tied so as to retain the parts in this situation; and if care be taken to make the ligatures pass between the pins, and not immediately over them, no harm or inconvenience will occur from them. It rarely happens however that any assistance of this kind is needed; for I have, in almost



most every instance, found that the pins answer extremely well without any support whatever.

It is scarcely necessary to observe, that during the time the pins are in the lip, the patient should be fed upon spoon-meat, and should be prevented from laughing, crying, or from stretching his mouth in any manner of way.

The pins having remained in the lip for five or six days at farthest, they should now be taken out; for by this time, as I have found by experience, the most perfect union of the parts is produced; and by remaining longer they are apt to leave marks which do not so readily disappear as when they are taken out sooner. I believe, indeed, that three days would frequently prove sufficient; but as I know from experience that the pins may without detriment be allowed to remain in the sore for five or six days, I think it better not to remove them sooner.

This is the practice we wish to advise for a common case of hare-lip; and, as a  
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farther illustration of it, some figures are delineated in Plate LVII. representing the appearance of the disease before the operation—the parts which ought to be removed—the application of the pins—and the appearance which the parts should have when the operation is finished. But for a more particular account of these, we must refer to the explanation of the Plate.

What we have hitherto been saying relates to the disease in its most ordinary form. In the case of a double hare-lip, there is a necessity for performing the operation twice in all its parts; first in one fissure and then in the other. By some we are directed to do them both at one time: but this ought by no means to be attempted; for by doing so we incur much risk of losing all the advantage that may be derived from the intermediate sound parts, and of which I once met with a very disagreeable instance. The sound part of the lip lying between the two fissures was by no means inconsiderable, but being much stretched with a great number of pins  
passed

passed through it, it began to inflame immediately after the operation ; and the inflammation and pain increasng, the whole pins were obliged to be removed, and the patient would not afterwards submit to any farther trial. We ought, therefore, first to complete the cure of one fissure ; and this being done, we may in the space of two or three weeks venture with much safety on the other.

In describing this operation, we have desired, that although the fissure may not extend the whole breadth of the lip, yet that the cut should pass up to the upper part of it ; And any person accustomed to this operation will know, that the parts may be united much more neatly in this manner, than when the lip is only cut through part of its breadth. By the one method of treatment, the parts when drawn together are smooth and equal ; but by the other, they are commonly uneven and much puckered.

We have also desired that the surgeon should take particular care to make the  
two



two sides of the cut exactly of an equal length; a point of much importance in this operation, and requires more attention than is commonly paid to it: for it is obvious, if one side of the wound be longer than the other, that the cicatrix cannot be made smooth and even as it ought to be; by inserting the first pin at the edge of the lip, this part of it will be very properly united, but the rest of it will have a very disagreeable appearance. The most effectual method of guarding against such an occurrence is, the marking with small dots of ink, not only the length of the cut on each side, but the direction which it ought to take, by which every chance of going wrong is prevented.

In proceeding to this operation, it is of much importance to have the lip equally and tightly stretched while the incision is making in it, otherwise the edges of the fore will be ragged and uneven: This may be always prevented by proper attention; but with a view to guard against it as much as possible, curved forceps may be

employed for laying hold of the lip. They are delineated in Plate LV. fig. 1. They should be made so as to compress the lip equally; and being applied in the direction intended for the incision, the scalpel should be carried along the side of them, by which means the cut may be made very exact and even. Various forms of this instrument have been recommended; but the one we have delineated is of a more simple construction, and answers the purpose equally well, if not better, than any of them.

By some we are desired not to employ any instrument of this kind, on the idea of their irritating and bruising the lip. This suspicion, however, can have occurred only to those who have never used them; for when they are smooth and equal in every part, a degree of compression may be employed with them, perfectly sufficient for fixing the lip without creating the least uneasiness to the patient. This I can assert from much experience of the utility of this instrument.

Instead of making the incision in this manner, some authors have directed it to be done by fitting a piece of pasteboard, lead, or tin, to the gums beneath; and the lip being placed upon it, to cut down with a scalpel upon the supporting substance: The operation may be very properly done in this manner, but the cut is more easily made in the manner we have directed.

Till of late the incision in this operation was commonly made with scissars; and although they are now very generally laid aside on the supposition of their bruising the lip, yet the operation may be very properly done with them. I would not think it right to employ scissars to cut a part of much thickness, but the lip is seldom so thick as to render it improper to use them in cutting for the hare-lip. They have of late been used in this place by different practitioners; and as a point of this kind can be determined by experience alone, I have likewise employed them. In order to ascertain which of the two modes of operating, that with  
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with the scalpel or with the scissars, ought to be preferred, I in one case made the incision in one side with a scalpel, and in the other with scissars. The patient averred that the scissars gave least pain, probably from their making the cut in somewhat less time than is necessary with the knife; and, during the cure, that side of the lip which was cut with the scissars neither swelled nor inflamed more than the other. I do not from this, however, mean to say, that I consider scissars as preferable to the scalpel; I mention it only to show that the common idea entertained of them is ill-founded, and that the operation may be equally well done with both instruments. Scissars for this purpose should be very strong, and particularly firm at the joint. They ought also to be highly polished. The size and form of them represented in Plate LVI. fig. 1. has been frequently used, and is found to answer.

When describing the Twisted Suture in Vol. I. I gave the preference to gold pins;

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and

and I am still of opinion that they are the best. When of a proper form, such as are represented in Plate II. figs 2. 3. and 4. they pierce the lip with much ease without any assistance from a *porte-aguille* : but they who think that a sharper and firmer point than can be given to gold will answer better, may have steel-points added to them, as is represented in Plate LVII. ; and the steel-points being moveable, they may be removed after the pins are passed, by which every risk is prevented of their wounding the contiguous parts. By some practitioners, flexible needles are employed for this operation ; but they have not been found by experience to answer so well as those which are firm and give sufficient resistance to the ligatures.

In passing the needles, I have said that they should go nearly through to the opposite side of the lip : This ought to be particularly attended to, otherwise a fissure will remain in the inner part of the lip, which may afterwards prove troublesome by the food lodging in it. And besides, although

although the discharge of blood which succeeds to this operation is always stopt immediately on the parts being drawn together by the ligatures where the pins have been properly introduced, yet when they are not passed to a sufficient depth, the blood will continue to get out behind, and may afterwards be productive of much distress. I have seen an instance of this where a very troublesome oozing of blood continued for several days after the operation; and an instance is recorded of even death ensuing from it. In order to prevent the lip from being stretched by the patient spitting, it is the usual practice to desire him to swallow his saliva with any blood that may be discharged from the fore. In this case the patient complied implicitly with the directions given to him; and he died from the cause I have mentioned, namely a great loss of blood. His stomach and bowels were found filled with blood which he had swallowed \*.

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\* Vide Memoires de l'Academie Royale de Chirurgie, Tom. IV. p. 427.



There being the least chance of such an occurrence, should be a sufficient reason for patients being prevented from swallowing their spittle after this operation, till it is observed that there is no blood mixed with it; but besides, it sometimes happens, that sickness and vomiting is induced even by a very small quantity of blood passing into the stomach, by which the lip is much more stretched than it would be by all the blood from the wound being spit out.

We have thus described all the steps of the operation for the hare-lip: and it is proper to observe, that they are equally applicable in the treatment of a fissure in the lip by whatever cause it may be formed; only, in a recent cut, as the edges of it are already raw, all that the surgeon has to do is to insert the pins and apply the ligatures. In wounds where suppuration has already commenced, there is usually some degree of inflammation upon the edges of them: While this continues it would be improper to draw them together by  
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ligatures ; but as soon as the inflammation subsides, we may with much propriety insert the pins and finish the operation in the manner we have directed. We are told indeed by many, that this practice will succeed only in recent wounds, and that it ought not to be recommended where matter is already formed : I have often, however, acted otherwise ; and I have uniformly found, where the edges of a fore have not become callous, that they have been united as easily when covered with pus as when perfectly recent and covered with blood.

In cases of hare-lip attended with a fissure in the bones of the palate, after uniting the soft parts in the manner we have pointed out, some advantage may be derived from a thin plate of gold or silver, being exactly fitted to the arch of the palate, and fixed in by a piece of sponge stitched to the convex side of it, and inserted into the fissure. If the sponge be inserted dry, and be properly fitted, the moisture which it imbibes from the con-

tiguous parts will in many instances make it remain sufficiently firm, by which both speech and deglutition will be rendered more easy. In some cases, however, the form of the fissure is such as prevents the sponge from having any effect. This always happens when the opening is wider outwardly than it is found to be more internally. For such cases other means have been proposed, especially thin plates with gold springs, made so as to fix upon the contiguous parts; but no invention of this kind has been yet found to succeed.

## SECTION II.

### *Of the Extirpation of Cancerous Lips.*

THE under lip is more frequently attacked with cancer than any other part of the body; and as we know of no internal remedy by which this disease can be cured, the only means we employ for it is the removal



removal of the part affected. In a former publication, we endeavoured to show, that little dependence can be placed either on arsenic or any of the caustic applications, which have been so much recommended for this purpose; and that we are to trust to the scalpel alone for relief.

When a cancerous sore has spread over any considerable part of the lip, and especially when the lip is altogether affected, all that a surgeon can do is to remove the diseased parts; to secure the divided arteries by ligatures, when this is found necessary; and to dress the sore as a recent wound from any other cause. In this manner a cancer may be effectually taken away; but it gives a very disagreeable appearance, the under teeth and gums being left all uncovered; and the patient can neither retain his saliva, nor swallow liquids, but with much difficulty. There is here, however, no alternative; for where the whole lip is obliged to be taken away, the inconveniences we have mentioned must necessarily ensue, as there is  
no

no possibility of drawing the divided parts together.

But when the disease has not attacked any considerable part of the lip, we may always have it in our power to draw the edges of the cut together so as to make them unite with the twisted future in the manner described in the last section: by which we not only prevent a great deformity, but the patient is equally capable as he was before the operation, of swallowing liquids and retaining his saliva: And besides, this method of treatment, as we have elsewhere remarked, by leaving a very small extent of cicatrix, seems to have some effect in preventing a return of the disease; at least this has been evidently the case with those that have fallen under my observation. Where the operation has been performed in the usual way, without drawing the divided parts together and uniting them by ligatures, the disease has in several instances returned: But, excepting in a very few unfavourable cases, it has never returned where the hare-lip method

thod of treatment has been employed, Nay more, this will sometimes succeed where the other has failed. A man appeared at our Infirmary here with a cancer on the under-lip. It had been twice removed by extirpation in the usual way; but the disease returned after each operation soon after the healing of the sore. As there was not so much of the lip removed as to prevent the sore from being treated in the manner we have directed, after taking away all the diseased parts this method was accordingly put in practice. The cure was completed; and I had an opportunity of knowing, eight years after the operation, that the man remained in good health, without any return of his disease. Nor should we be deterred from doing the operation in this manner by the disease being extensive, if we find that the parts which have been divided can be drawn together and retained by the twisted suture: And this, we may remark, may be always done where the disease does not render it necessary to remove almost the whole lip. These parts  
stretch



stretch so considerably, that in general this method of treatment may be adopted, although a third part only of the lip is left after the operation. With respect to the method of doing the operation, we must refer to the last section. In addition to what was then said, we have to observe, that all the cancerous parts ought in the first place to be removed, taking care to form the cut in such a manner as will most readily admit of the edges of it being easily and neatly drawn together. When the disease is seated in the lip only, the parts will have nearly the same appearance after this operation, as they have after that for the hare-lip. But when the disorder extends to the cheek, as is sometimes the case, a longitudinal division of the lip will not only be necessary, but a transverse cut into the cheek; both to be united by pins and ligatures: an operation which in different instances I have put in practice with very complete success.

C H A P.   XXX.

*Of the DISEASES of the MOUTH.*

S E C T I O N   I.

*Anatomical Remarks.*

**B**EFORE we proceed to consider the diseases which are the object of the present chapter, it will be proper to premise a short anatomical description of the teeth, gums, and jaws, the parts in which these diseases are chiefly seated.

On examining a tooth, we find it divided into two parts ;—that part of it which  
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lies above the gums, termed the Body or Corona of the tooth;—and the roots or fangs, which the gums, in a state of health, cover entirely. In the most part of teeth, a kind of depression is observed between the body and fangs, just where the bones commonly terminate: This is termed the Neck of the Tooth.

The root, as well as the interior part of the corona, is composed of an osseous kind of matter; but it appears to differ from bone by our not being able to throw injections into it: for although we are told that this may be done, there is much reason to imagine that the opinion is ill-founded, from the best anatomists having failed in it\*.

This osseous part of the teeth being of a soft texture, would soon suffer and wear away by mastication: But nature has amply provided against this inconvenience; for we find all that part of them which lies

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exposed,

\* Vide the Natural History of the Human Teeth, by John Hunter, 2d edition, p. 36, &c.



exposed, by being above the gums, covered by a very firm, hard substance, termed the Enamel, which protects them effectually against every injury of an ordinary nature. This part of a tooth, besides being much harder than bone, differs from it likewise in our not being able to pass the most subtle injection into it; nor can it be tinged by feeding an animal upon madder or any other colouring substance, as is the case with every bone in the body. The enamel is thickest on the upper surface of the teeth, especially in the grinders, where it is most needed; and it becomes gradually thinner as it approaches the neck, where it terminates. At this part we find the commencement of the periosteum, which covers all the roots of the teeth, and is intimately connected both with them and with the surrounding sockets.

In the interior part of every tooth we discover a hollow, or cavity, corresponding to the size and figure of the tooth itself. It commences by a very small opening in the extremity of the root or fang, at which  
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the blood-vessels and nerves of the tooth enter; and this canal becoming wider as it proceeds forwards, terminates at last in the body of the tooth, where we find the cavity filled with a pulpy kind of substance, probably formed by an expansion of the blood-vessels and nerves belonging to it. A tooth with one root or fang has commonly only one hole or opening in it; but some teeth have several fangs, and every fang has a canal passing through it, and is supplied with distinct blood-vessels, and probably with separate branches of nerves, although these have never been clearly traced into them.

The teeth are fixed in what is termed the Alveolar Process of each jaw. This consists of a broad thick edge, with which the jaws are furnished, divided into separate cells or openings for the fangs of the different teeth; and the roots of the posterior teeth being larger and more expanded than the others, we find accordingly that this part of the jaw is thicker and broader than the fore part of it. In the upper jaw

this difference, with respect to thickness, is increased by the antrum Highmorianum, a large sinus or cavity in each maxillary bone immediately above the large molares or grinders of each side. This sinus has no communication with the mouth, but it opens into the nostril between the two ossa spongiosa, by a canal, which in the skeleton is large enough to admit a common quill. The alveolar process of the upper jaw is divided from this cavity by a thin plate of bone, in which the roots of the posterior molares commonly terminate; but in some instances they pass through this plate into the antrum itself.

The lower jaw is in infancy composed of two bones, united at the chin by what is termed the Symphysis of the jaw. These bones however are soon joined so firmly together, as to have the appearance of one continued and connected piece. Besides the alveolar process, the under jaw is on each side furnished with other two processes, with which it is necessary for practitioners to be acquainted. The anterior,



which seems to be chiefly intended for the infertion of the temporal muscle, is termed the Coronoid Process. It arises in the form of a ridge from the outside of the jaw opposite to the two posterior molares; and proceeding backward and upward, it terminates in a thin sharp point: And the posterior, or condyloid process, which is shorter, thicker, and stronger than the other, terminates in an oblong head or condyle, by which the articulation is formed between this bone and the head.

The coronoid process gives a degree of strength and thickness to the external plate of the alveolar process in this part of the jaw that does not take place in any other part of it. This renders it highly improper to attempt the extraction of the two last molares by turning them outwards. They should always be pulled towards the inside of the mouth. Through all the rest of the jaw, the sockets or alveolar processes are weakest on the outside, although the difference is inconsiderable; and they are in both sides weaker in the upper than in the under jaw.

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The full number of teeth in an adult is thirty-two ; and as they are of different forms, and intended for different purposes, they are accordingly distinguished by particular names. The four anterior teeth in each jaw are named Incisores ; the next to these on each side are the Canine ; and the five posterior teeth on each side are termed the Molares or Grinders ; the two first the small molares, and the other three the large grinders.

In childhood there are only twenty or twenty-four teeth, which continue till the sixth or seventh year, when they begin to drop, and are succeeded by others which are termed the Adult or Permanent teeth. The first set, or milk teeth as they are commonly called, as well as some of the others, are formed in the jaw before birth ; but they do not in general appear above the gums till the child is several months old. In some instances, about the fourth or fifth month, but most frequently about the eighth or ninth, two of the incisores appear in the lower jaw. These are com-

monly succeeded by two in the upper jaw, and the other four fore teeth appear afterwards, at uncertain periods, between this and the tenth or twelfth month. About the sixteenth or seventeenth month, four of the large molares appear; for in childhood there are no small molares: One of these push out on each side, leaving a space between them and the incisores for the canine teeth; which being formed farther up in the jaw, seldom appear before the twentieth month: but about this period, or between this and the end of the second year, both they and other four molares have commonly made their appearance.

These are the periods at which the infantine set of teeth usually appear; but much variety is met with in this point. I have known the canine teeth appear before any of the molares. In one instance they came forward before two of the incisores. In some cases the incisores have been observed in the second and third months, nay even at birth; whilst in others, I have known



known the fourteenth or fifteenth month pass over before any have appeared.

These teeth continue firm till the fifth or sixth year. About this period they begin to loosen; and between the seventh and twelfth year they are commonly all shed and succeeded by others. By this period, too, the jaws are somewhat lengthened, so as to admit of other four molares. Between the twelfth and sixteenth years four others appear; and in general about the twentieth year the four last of the molares appear, usually named the *Dentes Sapi-entiaë*.

The two sets of teeth we have described have very different appearances, inasmuch that we may in general know, from the appearance of a tooth, whether it belongs to the infantine or permanent set; and as this is often a point of importance, it ought to meet with particular attention. It is particularly necessary to be acquainted with their appearances in the treatment of those disorders of the teeth which occur about the time of shedding the first set:

for it frequently happens that we would have no hesitation in pulling a tooth, were we certain that it belonged to the first set; while we would rather decline to take it out if it appeared to be one of those which should continue during life. It has happened indeed in a few instances, that a third set of teeth have appeared; but this is a very rare occurrence, and is only to be considered as a very unusual deviation of nature.

The sockets of the teeth, and a small portion of the teeth themselves, are covered with a red, firm, fleshy kind of substance, termed the Gums. This substance seems to be almost entirely vascular; for the slightest wound or scratch in it is always attended with a discharge of blood. The alveolar process of each jaw is entirely covered with it; so that we find a small portion of the gums between every two teeth. In some diseases, particularly in the scurvy, a partial separation often occurs of the gums from the teeth; but in a healthy state they adhere so firmly to the necks of  
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the teeth as to have some effect in fixing them in their sockets.

We shall now proceed to treat of the diseases of these parts, and of the operations performed upon them.

## S E C T I O N II.

### *Of Dentition.*

**D**URING the approach of the first set of teeth, and in some instances of that of the second, much distress is frequently experienced from the irritation produced by the teeth upon the gums. For this reason I have thought it right, before proceeding to the diseases of the mouth, to offer a few general observations on Dentition.

In Dentition the gums inflame and become full about the part where the teeth are afterwards to appear. The child is constantly rubbing the gums with his fingers. The saliva is for the most part in-



creased in quantity ; but in a few instances it is otherwise, and the mouth becomes perfectly dry. The bowels are commonly very irregular, the patient being on some occasions extremely costive, and on others distressed with a diarrhoea. The heat of the body becomes increased, and quickness of pulse takes place along with other symptoms of fever. These are the most frequent symptoms attending dentition ; but it often happens that they are accompanied with subfultus tendinum, and even with convulsions.

As these symptoms originate from irritation, those means are chiefly to be depended on which are most effectual in counteracting this. Hence we derive much advantage from opiates, blisters, and especially from warm bathing. But when these fail, which they often do, we have it frequently in our power to remove every symptom, by making an incision through the gums directly upon the approaching tooth or teeth ; an operation usually termed Scarifying of the Gums.

A common prejudice prevails against this operation, from an idea of some harm being done by it, in the event of a cicatrix being left upon the gums, which sometimes happens when the tooth is not just at hand; for it is supposed that the cicatrix will afterwards be worse to penetrate than if the gum had not been touched. For this reason the operation is seldom or never done till the tooth is observed to have elevated the gum considerably: but in this we are wrong; for when delayed so long, almost all the advantages which may be derived from it are lost. I have commonly observed, that the very worst symptoms which occur from dentition, take place before the teeth have come this length; and that they usually abate on the teeth approaching towards the surface of the gums, probably from the gums being rendered more insensible by the long continued pressure of the teeth beneath.

Whenever we have reason to suspect, therefore, from the nature of the symptoms, that they are owing to this cause, we  
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ought without hesitation to make a free incision through that part of the gums where there is most reason to expect a tooth ; and if this incision should afterwards heal, and if the symptoms supervene again, no risk can occur from the operation being repeated. I have frequently found it necessary to cut two or three times upon the same tooth ; but with a view to prevent the necessity of this, I commonly make a crucial incision down to the depth of the tooth, and I have never observed any inconvenience to occur from it. We have no cause whatever to be afraid of hemorrhagy. Indeed the cut seldom bleeds above a few drops, and it commonly heals easily.

The operation may be done with a common lancet, or with a bistoury or scalpel, the instruments usually employed for it : but it cannot be neatly done with any of them ; and besides, we are in danger, either with a lancet or scalpel, of hurting the contiguous parts. The instrument represented in Plate XLIX. fig. 4. is not liable to any of these objections ; and being  
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of a small size, it may be entirely concealed in the palm of the hand. The child being secured by the nurse, the surgeon with the fingers of one hand should open the mouth; and conducting the edge of the instrument with the fore-finger of the other, the incisions should be finished before withdrawing it, by making a crucial cut over every tooth that appears to be approaching. The incision, as we have already advised, should always be carried to the depth of the tooth, so as to lay it entirely bare; and when this is freely done, the effects which result from it are often remarkable. I have seen instances of children being instantly relieved by this operation who had previously appeared to be in the most imminent danger.

It sometimes happens too, as we have already observed, that disagreeable symptoms take place from the approach of the second set of teeth. I have known pain produced over the whole jaw, attended with swelling and inflammation of the gums and cheeks, from a single tooth not  
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getting freely out. This happens most frequently with the dentes sapientiæ; in some instances, from the usual cause of irritation produced upon the gums, which in the back part of the jaws are very thick, but in others from there not being room in the jaw to admit them. In the first case, we have it commonly in our power to remove all the symptoms, by making a free incision directly upon the tooth; but in the other this does not always prove sufficient, and nothing will frequently answer but the extraction of the tooth. When it is discovered that the symptoms originate from this cause, we should not hesitate about the removal of the tooth: for it seldom happens that any advantage is gained from delaying it, and the inflammation induced upon the gums often spreads to the throat and other contiguous parts; and is thus productive of much distress, which might be easily prevented. When the throat inflames and swells from this cause, no other remedy will prove successful; and it is often surprising how soon

soon the most violent degree of inflammation is removed by it. I have known instances of much distress in the throat relieved immediately by the removal of a tooth, which had obstinately resisted every other means for several weeks.

## SECTION III.

*Of the Derangement of the TEETH.*

THE second set of teeth frequently appear in a very irregular manner: Some of them will be very properly placed, while some are farther out upon the jaw, and others farther in, than they ought to be. When the derangement is not very remarkable, it seldom meets with much attention; but in some instances the deformity produced by it is so considerable as to require the assistance of art for removing it. It occurs most frequently in the inci-



incisores and canine teeth, feldom or never in any of the molares.

Derangements of the teeth may occur from different causes:—from a deficiency of space in the jaw, by which they cannot be all admitted in one circle;—from a natural mal-conformation;—or from some of the first set remaining firm after the second set have appeared.

It will sometimes happen, that the teeth which are out of the circle will fall into it without any force being applied to them, on space being given to them by one or more of those which are in the circle being pulled. When it appears, therefore, that the derangement is owing to any of the first set not having dropped, they ought to be taken out immediately; for the longer it is delayed, there will be the less chance of the irregular teeth falling into their situation: but when it is even owing to those of the second set being too large for the space they are to fill, we should not hesitate in removing some of them, for no other method will prove successful. When the teeth which occupy the natural circle of the

jaws are regular and have a good appearance, the tooth or teeth which are out of the circle ought to be pulled; but when either of the contiguous teeth do not fill the place so properly as these would do, or when they are rough or otherwise of a disagreeable appearance, it may sometimes be advisable to pull one of these that are in the circle, and endeavour to bring the others into the range. If this be done before the teeth have been long fixed, and if they are not far distant, they will sometimes in a gradual manner, as we have said, fall into the vacancy without any assistance; but when this does not happen soon from an effort of nature alone, we may frequently employ means for promoting it. No attempt, however, of this kind can be made till the body of the deranged tooth has passed freely out from the gums, as till then it cannot be easily laid hold of.

The usual method of moving teeth which are out of the circle, is by applying a ligature round them, and tying each  
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end of it firmly to the contiguous teeth, and pulling it tighter from time to time: or a plate of gold or silver is fitted to the contiguous teeth, and made to surround the deranged teeth in such a manner that when it is firmly pressed down by the opposite jaw, it acts with considerable force in bringing the teeth nearer together. This last method, however, is extremely troublesome to the patient; and the other, at the same time that it will in some degree move the deranged teeth towards the circle, will nearly in the same proportion draw the others out of it; but we may in another manner apply a ligature for this purpose with perfect safety, and it is by much the best we have yet seen of moving deranged teeth. Let a thin plate of gold, of a length sufficient to pass over four of the contiguous teeth, be exactly fitted to the side of those teeth opposite to that which is to be moved. The plate should be perforated with several small holes: On being applied to the teeth, and tied to them by a bit of waxed thread, let



a piece of flexible wire or a bit of catgut be passed through two of the holes; and the doubling of the ligature being carried over the tooth to be moved, the two ends of it should be firmly drawn through the holes, and should now be fixed with a pair of pliers. Every three or four days the ligature should be made somewhat tighter; and this being persevered in, almost every tooth in this situation may at last be brought into the circle.

It sometimes happens that a good deal of deformity is produced by an opening in the anterior part of the jaw, formed either by one or more teeth being accidentally driven out, or from their being a natural want of them. When a practitioner is called immediately on a tooth being driven out, he ought by all means to replace it; or if the tooth be broke, or otherwise much injured, he may consult the inclination of the patient with respect to the transplanting of a sound one from the mouth of another person. But in matters of this kind the patient seldom complains till the

parts affected have become inflamed and tumefied, when it is too late to put this method of treatment in practice. In this situation we must wait till the pain and swelling are entirely removed; when, if more than one tooth is wanting, the deficiency must be supplied with artificial teeth fixed to those which remain firm; but when one tooth only is wanting, we may frequently, in young people, be able to remove the deformity by passing a ligature round the two contiguous teeth, so as by degrees to draw them nearer together. Nature will frequently effect this, in some degree, of herself: but the operation is commonly slow; and besides, it is seldom done so completely as when a ligature is employed. By this means the bodies of the teeth are equally drawn together; but when the ligature is not used, although the teeth, from want of support, will fall nearly together at their points, the opening will commonly remain nearly the same at their roots.

S E C T.

## SECTION IV.

*Of GUM-BOILS.*

THE gums, like all the soft parts of the body, are liable to abscesses ; but collections of matter occur more frequently in the gums than in other parts, from their being more exposed to causes which tend to produce them. Abscesses may in this situation originate from cold and from external violence, as well as from every cause which tends to produce inflammation in other parts ; but they are for the most part traced as the consequence of toothach : and they occur not only from carious teeth, but from inflammation at the roots of teeth, when perhaps in every other respect the teeth may appear to be sound.

A gum-boil commonly appears after a fit of toothach has continued for some time. It begins with some degree of pain, attend-



ed with a small tumor on the part affected. By degrees the cheek swells; and this swelling frequently spreads over the whole face so as to produce much deformity. On suppuration taking place, the small tumor, which is commonly seated on the outside of the gums exactly opposite to the diseased tooth, begins to point; and if it be not opened, it generally bursts either through an opening in the side of the gum or between the gum and the tooth. A quantity of matter is now commonly discharged, by which the patient in general receives effectual relief: But as the cause still remains, the discharge likewise continues; for as the disease is most frequently induced by some affection of a tooth, or by a portion of the jaw becoming carious, a stillicidium of matter usually continues, either till the diseased tooth is removed, or till the carious part of the jaw has exfoliated: Or, if the opening happens to close, the disease will be soon renewed by the swelling returning, and again going thro' all the stages of inflammation and suppuration

ration in the manner we have already described. When indeed the disease is owing merely to inflammation at the root of a tooth, and when the root happens not to be denuded of its periosteum, after the matter of the abscess is evacuated, the sides of it may collapse and adhere, and a cure will in this manner take place: But when the disease is produced either by a carious tooth, or by a carious portion of the jaw, or even when it proceeds from inflammation alone, if the root is laid bare by the matter, the disease will not be perfectly eradicated till the tooth or carious part of the jaw is removed; for these will continue to irritate the contiguous parts in the same manner with extraneous bodies of any other kind. In the case of a spoiled tooth, we should advise it to be immediately removed: but when the disease originates merely from inflammation at the root of a tooth, before pulling it every method of a more simple nature ought to be tried; and the same means which we employ in the treatment of abscesses in other parts

should be put in practice here. When a free opening is produced by the bursting of the abscess, we may sometimes be able to dry up the running, by injecting from time to time a little lime-water—ardent spirits—tincture of myrrh—or tincture of Peruvian bark properly diluted. But although trials of this kind may be advisable with timid patients, who will not submit to other means, we can seldom place much dependence upon them: The most effectual practice is, to lay the abscess open by an incision from one end to the other, and to endeavour to heal it from the bottom by inserting a small doffel of lint between the edges of it, to keep it open till it is nearly filled beneath with proper granulations. This is the surest method of obliterating the cavity of the imposthume; and when any portion of the socket is carious, it will more readily exfoliate than it would do were it still covered with the gums.

We have hitherto been supposing that the abscess is seated in the gums, or between  
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tween the gums and the tooth, or perhaps that it furrounds the socket of the tooth; but it often happens that more deeply seated abscesses occur, which create not only more immediate pain and distress, but more subsequent risk: for when the more solid parts of the jaw become carious, which they commonly do when the matter of imposthumes gets into contact with them, the cure not only proves extremely tedious, but marks of a disagreeable nature are apt to occur from it externally. With a view to prevent these distressing occurrences, we ought not to solicit the formation of pus by the usual method of applying warm poultices outwardly; we ought rather, by warm fomentations taken into the mouth, and by the application of any warm stimulating substance, such as a roasted onion, to that part of the gum which appears to be most affected, to endeavour to excite a suppuration that may point into the mouth; and as soon as there is any reason to suppose that matter is

formed in the abscess, it ought to be opened without waiting for a complete suppuration.

In the after-treatment of the abscess, all that we can do is to preserve a free depending orifice for the discharge of any matter that may form, by which any farther mischief will be prevented, and by which alone we can reasonably expect a cure; for even where the disease is connected with a carious state of the jaw, giving a free vent to the matter is perhaps all that art ought in this situation to attempt. If the constitution is otherwise sound, this, together with the removal of any of the contiguous teeth that are spoiled, and of such parts of the jaw as are carious and separate from the rest, will ultimately effect a cure if this by any means be practicable. But in diseased habits of body, especially in scrophulous constitutions, affections of this nature are always productive of much distress, and can seldom indeed be healed till the general disease of the system is removed.

## SECTION V.

*Of Abscesses in the ANTRUM MAXILLARE.*

COLLECTIONS of matter may occur in the antrum maxillare from various causes : whatever tends to induce inflammation on the lining membrane of this cavity may be productive of them. Hence they may be induced by blows and other injuries done to the cheeks. Inflammatory affections of the membrane of the nose, and even long-continued inflammation of the eyes, by spreading to the contiguous membrane of the antrum, have often appeared to have some effect in producing collections of this kind ; and much exposure to cold has frequently been traced as the cause of them. But the most frequent origin of this disease, is the pain and irritation produced in the jaw by repeated and violent returns of toothach.

From this history of the cause of the  
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disorder, the nature of the symptoms will be readily understood. Indeed, if we make allowance for the nature of the parts in which they occur, they will be found to be nearly such as take place from inflammation and abscesses in other parts of the body. At first some degree of pain is felt over the cheek of the affected side, and this frequently continues for a considerable time before any external swelling is perceptible. On a farther continuance of the disease this pain becomes more severe, and in some instances spreads to the neighbouring parts, so as to create uneasiness in the eye, nose, and ear; and at last an extensive hard swelling appears over the whole cheek, which sooner or later points at a particular place, most frequently in the centre of the cheek, a little above the roots of the posterior molares. In some instances, indeed, the matter bursts out between the roots of these teeth and the gums, by which the external tumor upon the cheek is prevented from pointing. This, however, does not commonly happen; and only takes

takes place, I imagine, when the roots of the teeth penetrate the antrum, by passing through the plate at the bottom of the socket. For the most part, too, as soon as matter is fully formed in the antrum, we find some of it discharged by the corresponding nostril, when the patient lies upon the opposite side with his head low; and if this occurs frequently, it prevents the external swelling for a considerable time from pointing at any particular place, and consequently from bursting, which it always would do if the matter was not evacuated in some other manner.

This discharge of matter by the duct leading from the antrum to the nostril does not indeed occur in every instance; but as I have met with it in several cases, I am not inclined with Mr Hunter to consider the obliteration of this duct as a frequent cause of these collections\*: Indeed I doubt if it is ever the cause of them. For the most part, they may be traced as the consequence of one or other of the causes

\* See a Practical Treatise on the Diseases of the Teeth, &c. by John Hunter, F.R.S. &c. p. 44.

causes we have mentioned; particularly of toothach, or of inflammation excited in some other manner. It therefore appears probable, when obstructions are met with in this duct, that they are rather to be considered as a consequence of the disease; perhaps most frequently as the effect of the adhesive stage of inflammation, than as the cause of the collection.

A discharge of matter from one of the nostrils, when it succeeds to pain and inflammation of the cheek, will for the most part be found to originate from an abscess in the corresponding antrum maxillare: but we ought to remember that matter may be discharged from the nostrils from other causes; particularly from an inflamed state of the membrana Schneideriana; from an ozena; from affections of the frontal sinuses; and from abscesses in the lachrymal sac. In forming an opinion, therefore, of such an occurrence, every circumstance connected with it should be taken into consideration, otherwise much disappointment and inconvenience may  
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frequently occur by our treating one disease for another.

In the treatment of abscesses of the antrum maxillare, nothing will ever accomplish a cure but a free discharge being given to the matter: indeed collections of matter in this situation should be considered in the same light with similar affections in whatever part of the body they may occur. Wherever matter is discovered, it ought to be discharged as quickly as with propriety it can be done; and in no instance is it more necessary to attend to this than in abscesses of the antrum maxillare: for if the matter be not evacuated, it will distend and elevate the bones of the cheek, and at last will probably render them carious.

With a view to prevent such a disagreeable occurrence, a perforation should be made into the antrum as soon as there is sufficient evidence, from the nature of the attending symptoms, to conclude that matter is collected in it. It may be perforated in two different parts. In that part of it which projects

projects outwardly over the two great molares; or one of these teeth may be taken out, and an opening made into the antrum, by perforating directly upwards in the course of one of the fangs. As most people wish to avoid the pulling of a tooth when it does not appear to be absolutely necessary, the perforation is commonly made in cases of this kind above the roots of the teeth. This lenity, however, proves often hurtful; for in this manner the perforation must be made in the side of the antrum, by which a depending opening cannot be given to the matter; nor can this be effectually obtained in any other way but by a perforation made in the manner we have mentioned in the direction of one of the roots of the teeth.

We have already observed, that either of the two large molares may be drawn in order to admit of this perforation. When either of them is spoiled, the diseased tooth ought to be taken out; for, being carious, there will be some reason to suspect that it may have some share in the formation of  
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the disease; but when this does not happen, we should remove the second great molaris, or that tooth which lies next to the dens sapientiæ; for although the tooth immediately anterior to this is somewhat more accessible, the difference in this respect is inconsiderable; and the plate of bone which separates the antrum from the roots of the teeth being thinner in the back part of the jaw than in the anterior part of it, the perforation is accordingly more easily made in it.

On removing one of these teeth, it sometimes happens that the matter is immediately discharged with freedom from the antrum; owing either to the roots of the teeth having been naturally so long as to penetrate this cavity; or, to the matter having corroded the bone which separates them from it. In this case, if the opening is sufficient for evacuating the matter, the operation will thus be completed; but as it is easily enlarged, it ought always to be done where there is any cause to doubt  
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that the matter will not be discharged with perfect freedom. But when no discharge of matter occurs on pulling the tooth, an opening must be made into the antrum in the manner we have already advised, by pushing a sharp instrument into it in the direction of one of the fangs. A common trocar is usually employed for this, and in general the operation may be well enough done with it; but the curved instrument represented in Plate L. fig. 2. answers better. In making the perforation, the patient should be seated on the floor opposite to a clear light, and his head should be laid back upon the knee of the operator, who may either be standing or sitting behind him. The instrument should be withdrawn as soon as it is found to have entered the antrum, which will be easily known by the resistance being removed from the point of it. The matter will now flow out freely; and as soon as it is all evacuated, a small wooden plug exactly the size of the trocar should be introduced into the opening,

ing, with a view to prevent not only the air, but the food during mastication, from finding access to the antrum; and if the plug be properly fitted to the opening, it will remain sufficiently firm, while at the same time there will be no risk of its slipping in, if it be formed with a knob or head somewhat larger than the rest of it.

This plug should be removed from time to time, perhaps twice or thrice in the course of a day; by which all the matter will be quickly evacuated; and no more being allowed to collect, the disposition to form it will in general be soon removed, and a cure will thus be obtained. But in some instances, either from much relaxation of the lining membrane of the antrum, or from some other cause of a similar nature, the discharge of matter does not diminish, but continues nearly the same both in quantity and consistence long after the operation. In this case we may often forward the cure by throwing liquids of a moderate degree of astringency from time to time into the antrum. A decoction of

bark is commonly employed for this purpose: but nothing should be used that contains the least particle of solid matter, as there is always some risk, when any thing of this kind is injected, of depositions being left in the antrum; and in different instances I have seen mischief occur from this. I commonly employ a solution of alum, brandy properly diluted, or lime-water.

When the contiguous bones are all sound, a due continuation of this practice will at last accomplish a cure; but when any of these are carious, it will be in vain to expect a cure till the diseased portion either exfoliates, or till it dissolves and comes away in the matter. The introduction of a probe will always render us certain whether any part of the bones in the antrum is carious or not; but we may in general rest satisfied with respect to this point, from the smell and appearance of the discharge. When the bones are carious, the matter is always thin and fetid, and it becomes thicker and less offensive as this affection of the bone diminishes.

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We have hitherto been supposing that the antrum is perforated for the purpose of discharging matter collected in it; but the same operation becomes necessary for the removal of other causes. I once met with an instance of a violent blow on the cheek terminating in a collection of blood in this cavity; and worms forming in it can only be removed by this operation. In what manner worms are produced in this situation, is difficult to determine; but whenever their presence is indicated by severe pains in the region of the antrum, not induced by tooth-ach or any other obvious cause, there can be no risk in making an opening for extracting them; but in this case there will be no necessity for removing any of the teeth. A perforation made into the antrum, immediately above the roots of the large molares, will answer the purpose sufficiently. We should not however rest satisfied merely with extracting such worms as appear about the opening: We ought to inject from time to time such liquids into the antrum as will most pro-

bably destroy any that may remain; particularly oil, a filtrated solution of asafoetida, and perhaps a weak infusion of tobacco: And the perforation should be kept open for a considerable time, to prevent as much as possible the risk of any worms being left.

I have mentioned the only two parts in which I think the antrum can with propriety be opened; namely, in the direction of the roots of the two large molares of the upper jaw; and immediately above the roots of these teeth on the outside of the jaw. I think it right however to observe, that it has been said, that a perforation may be also made into the antrum from the nostril. There is no doubt of this being practicable; but we might with perhaps equal propriety say, that an opening may be made into it by entering the instrument from the roof of the mouth. It is evident however, that it would not be so proper to perforate the antrum in either of these parts as in those we have mentioned; and therefore I would not have thought it necessary to take notice of them, were it  
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not with a view to give my opinion of this method of making an opening from the nostril; which being proposed by very respectable authority, I think it right that the younger part of the profession, for whom this is chiefly intended, should know that there is much cause to doubt of the propriety of it\*.

By pursuing the means we have recommended, almost every disorder arising from collections of any kind in the antrum maxillare may be completely carried off: But the antrum is liable to swellings of a different kind, of a much more dangerous nature, and which frequently do not terminate but in the death of the patient. They seem to originate from an enlargement of the bones of the cheek. No matter is found in the antrum; and therefore no advantage is derived from any perforation that is made into it. I have in different instances, indeed, observed much mischief

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\* V. The Natural History of the Human Teeth Part II. page 46. first edition, by John Hunter, F. R. S. &c.



ensue from it : for those who are not much accustomed to this branch of practice, are apt to be misled by the appearance of these swellings ; and, suspecting that they contain matter, they very commonly make perforations into them, which frequently aggravates all the symptoms, by occasioning a more rapid increase of the disease. We ought therefore to be attentive in endeavouring to distinguish swellings of this kind from real collections of matter in the antrum. In abscesses of this cavity the cheek seldom swells to any great extent ; and when the disease has been of long duration, if the matter does not find an opening into the nostril, or along the roots of the teeth, it commonly points towards the most prominent part of the cheek. But when no matter is collected, and when the disease proceeds from some affection of the bones, the swelling by degrees arrives at a considerable size, but it spreads equally over the whole cheek, without pointing at any particular part, excepting in the very latest stages of it, when the surrounding  
soft

soft parts becoming affected, suppuration sometimes occurs in them. Till the skin becomes inflamed, which never happens except where the disease has been of long continuance, the swelling remains quite colourless. But the most characteristic mark of it is a remarkable degree of elasticity which it acquires. The bones yield to pressure; but they instantly return to their situation on the finger being removed; and if in this state an incision be made into them, which I have known done, they are found to be reduced to a soft cartilaginous state, and in the advanced stages of the disease to a consistence somewhat gelatinous.

This kind of swelling is of a nature so very obstinate, that hitherto I have scarcely known any advantage result from the various remedies that have been employed in it. In a few cases where carious teeth have appeared to have some effect in producing it, the removal of them has put a temporary stop to the progress of the disease: but even this has never produced any permanent advantage; I mean in the real

diseased state of the bones we are now considering: for the cheek is, like other parts of the body, liable to swellings of a more harmless nature, which yield to the remedies commonly employed for them. But in this no benefit occurs either from internal medicines or external applications. Long continued gentle courses of mercury, along with decoction of mezereon, I have sometimes thought have proved useful; but the good effects resulting from them have never been of long duration.

## SECTION VI.

### *Of EXCRESCENCES on the GUMS.*

THE gums are liable to excrescences of different degrees of firmness. They are all of a red colour, nearly the same with the gums themselves; but some of them are soft and fungous, while others are firm, and even of a hard warty nature. In some cases, they are attended with pain; but



but for the most part they create no farther inconvenience than an impediment in speech and mastication. They are met with in both jaws, but most frequently in the under jaw and in the inside of the teeth. In some instances they are connected to the gums by a small neck, but in general they adhere firmly through their whole extent.

Excrescences of this kind frequently originate from carious teeth, and in a few instances from a carious state of the alveoli; in which case the removal of the spoiled teeth, and the subsequent exfoliation of the carious part of the jaw, will often accomplish a cure. Like fungous excrescences in other parts of the body depending on a carious bone beneath, as soon as the diseased part of the bone is removed the excrescence usually begins to shrivel, and at last commonly disappears altogether: but when this does not happen, the tumor should be removed as soon as it proves in any degree troublesome; and this should be the more readily proposed, as the operation

tion is attended with very little risk. With those not accustomed to this branch of practice, an aversion indeed prevails against meddling with tumors of this kind, either from an idea which almost universally takes place of their being of a cancerous nature, that will probably be rendered worse by an operation; or from a fear of the hemorrhagy that will succeed to the extirpation proving troublesome. We know from experience, however, that there is in general no cause to be afraid of either of these circumstances. I have extirpated several tumors of this kind; and I never knew an instance of a cancer succeeding to it, or of any hemorrhagy of much importance.

When the excrescence is attached to the gums by a narrow neck, it should be removed by passing a ligature round it of a sufficient tightness for making it drop off; but when it is connected to the contiguous parts by a broad base, we are under the necessity of taking it away with the scalpel. The actual and potential cautery used to be  
employed

employed for this purpose; but as this practice is now probably laid aside, and will not readily be revived again, we do not think it necessary to describe it.

In proceeding to the extirpation of the tumor, the patient should be firmly seated opposite to a clear light, and the head should be supported by an assistant standing behind. If he is possessed of sufficient resolution, there will be no need of instruments for keeping the mouth open; but where this cannot be with certainty depended on, which is commonly the case with children, a speculum oris becomes absolutely necessary. There are various forms of this instrument. The one in common use is represented in Plate LIV. fig. 3.; but it occupies too great a space in the mouth to admit of a free application of other instruments. To obviate this, I some time ago proposed the one delineated in the same plate, fig. 1.; and it has by experience been found to answer.

A common scalpel will for the most part answer for dissecting off the tumor;



but an operator ought always to be provided with others, particularly with a curved knife, such as is represented in Plate XXXVIII. fig. 1. Vol. III. and likewise with crooked scissars, such as are delineated in Plate XLIX. fig. 1. and 2.; for in some instances the roots of these excrescences are more easily separated with instruments of this kind than with those of a straight form. But whatever instrument may be employed, much advantage may be derived from elevating the tumor as much as possible from the parts beneath with a dissecting hook; and for this purpose a hook should be used with two fangs, such as is represented in Plate L. fig. 3. which answers much better than the single hook in common use. In the course of the operation, care should be taken to remove the diseased parts entirely, at the same time that the incision should not be carried so deep as to injure the parts beneath, unless the tumor is firmly and closely attached to them: in which case, it may not only be proper to remove a portion

tion of the gums, but even to go to the depth of the socket: But as this will be always attended with some risk of injuring the contiguous teeth by laying their roots bare, it ought never to be advised when with any propriety it can be avoided.

After the operation a moderate degree of hemorrhagy is advisable, and ought to be encouraged with a view to prevent the sore from inflaming: But when it proceeds too far, it should be restrained, by the patient taking from time to time a mouthful of spirit of wine or of tincture of myrrh; or if this does not prove sufficient, the application of lunar caustic will seldom or never fail.

The situation of the sore renders the application of dressings inadmissible: For some days, however, after the operation, the mouth should be frequently washed with a warm emollient decoction; and afterwards, if a cicatrix should not form so readily as it ought to do, the cure may be promoted by the application of lime-water,

water, Port-wine, tincture of roses, or any other mild astringent.

## S E C T I O N VII.

### *Of LOOSE TEETH.*

THE teeth ought naturally to continue firm till they become loose by the ordinary effects of old age: but they are liable to some affections which render them loose, and which even make them drop out at very early periods of life; and as this is often productive of much distress and deformity, it becomes frequently an important object with practitioners.

As the teeth may become loose from various causes, all of which require a different method of treatment, we shall enumerate the most material of them, and at the same time shall point out those means of cure which seem to be best adapted for each of them.

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The teeth are frequently loosened by external violence: By falls and blows—and often by an improper use of instruments in pulling some of the contiguous teeth when carious or otherwise diseased.

Teeth loosened in this manner can be made fast only by their being kept for some time as firm as possible in their situation; which may be done by pressing them as far into the socket as they will go, and fixing them with ligatures of Indian-weed, catgut, or waxed silk, to the contiguous teeth, and feeding the patient upon spoon-meat till they become firm.

In young people, when teeth are loosened by any of the causes we have mentioned, as the sockets at this age are complete, and as the teeth readily become firm again if proper attention be given to their being kept a due time in their situation by ligatures, this ought never to be omitted: nay, even when they have been forced entirely out of the sockets, they should always be replaced if they are not broke or much diseased. I have in several instances  
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put this method of treatment successfully in practice, and no harm can result from the trial. But in old age, when the teeth become loose, from whatever cause this may happen, the chance of their being again firmly fixed is very small; so that in very advanced periods of life the practice ought never perhaps to be attempted.

The teeth sometimes become loose from thick layers of tartar forming upon them, and passing in between the gums and the roots, and in some cases even between the sockets and the roots: In this case the removal of the cause, if it has not subsisted too long, will commonly be attended with a removal of the effect. The tartar should be completely scaled off: but it ought to be done as soon as possible; for the longer the teeth remain loose, the less chance there will be of their ever again becoming firm.

We frequently find the teeth become loose, from the gums becoming soft and spongy, and separating not only at their necks, but often a considerable way down

from the roots. This sometimes occurs from a long-continued course of mercury; but it is commonly, although often improperly, attributed to the scurvy. It no doubt occurs as a symptom in the real sea-scurvy: but this is a very uncommon disease at land; while the other, viz. a soft spongy state of the gums, is frequently met with.

When, however, it originates from a general scorbutic affection of the system, nothing but a removal of this will accomplish a cure; but when it is a local disorder merely, topical remedies are alone to be depended on. When teeth have remained long loose, we cannot with any certainty say that any means we may employ will render them firm; but the most effectual remedy hitherto employed, is, scarifying the gums both in the outside and inside of the affected teeth. The incisions should be carried deeply into the substance of the gums, and should be allowed to discharge freely, and they should even be repeated from time to time [as long as any of the teeth remain loose. By



this means the full spongy state of the gums we have described is often removed, and a disposition produced in them to adhere to the investing membrane of the teeth, by which they often become perfectly firm.

With a view to remove this sponginess of the gums, astringents are frequently prescribed; but I never knew any advantage result from them: On the contrary, a frequent use of them seems to do harm, by inducing some disposition in the gums which deprives them for ever of the power of adhering to the parts beneath: at least, I have met with different instances where this appeared evidently to be the case; in which, by a long continued use of remedies of this kind, the gums became so hard and firm, that the scarifications which were afterwards employed had no effect in fixing them. They should not therefore be used till an adhesion is produced between the gums and the teeth, either by means of scarifications, or in some other manner; and when this is accomplished, they may be employed with freedom, and even with advantage.

advantage. The remedies of this kind that are to be most depended on, are, tinctures of Peruvian bark, of oak bark, tincture of myrrh, and a strong solution of alum. The mouth should be frequently washed with cold water, strongly impregnated with any of these, at the same time that the patient should be directed not to use those teeth that have been loose till they have for some time been perfectly firm.

The teeth are sometimes loosened by the formation of abscesses between their roots and the alveoli; especially when the alveoli, from being thus immersed in matter, at last become carious: But having already treated minutely of this point when speaking of gum-boils, in the fourth section of this chapter, we must now refer to what was then said upon it.

It is scarcely necessary to mention the loosening of the teeth which occurs in old age; for this takes place from a cause for which there is no remedy. Not from the roots of the teeth decaying, or from their being pushed out of their sockets; but from

a real annihilation of the sockets; probably in consequence of the osseous matter of which they are composed being absorbed, while nature having now no use for teeth, does not continue to supply it.

## S E C T. VIII.

### *Of* CLEANING *the* TEETH.

THE teeth are apt to become foul from different causes, and frequently require the assistance of a dentist to render them clean.

1. They sometimes lose their natural healthy colour, and acquire either a dusky yellow hue, or become to a certain degree black, without any adventitious matter being perceptible on any part of them.

2. On other occasions they become foul, and give a disagreeable putrid taint to the breath, merely from a too long remora of the natural mucus of the mouth.

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3. But the most frequent cause of foul teeth, is a calcareous kind of matter commonly termed the Tartar of the Teeth, which seems to be a deposition from the saliva, as calculi in the bladder are from the urine. There are few people entirely exempted from this ; but some are much more liable to it than others, insomuch that I have known different instances, of the teeth becoming thickly incrustated with it, in the course of a few weeks after they have been completely freed from it.

The tartar first appears in the fore-teeth, and in those parts of them that are least liable to be rubbed upon by the tongue or by the lips. Hence it is first perceived on the outside, in the angles between two of the teeth near to the junction of the gums. The ordinary effects of mastication prevents it in general from spreading towards the points of the teeth: but the disposition to form it is in some constitutions so remarkable, that I have known it proceed from the gums upwards even over the flat surfaces of the grinders ; and in such in-

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stances,

stances, if it be not removed, it is apt to spread over the whole teeth so as to give the appearance of a continued incrustation from one end of the jaw to the other. In some cases again, instead of passing over the whole, it seems to fix more particularly on one or two teeth; and in such instances the deposition of this matter goes on so quickly as to give cause to suspect that the whole calcareous matter of the mouth is by some cause or other attracted to this particular point. I have known one or two teeth completely covered with it in the space of a few weeks, while the rest of the mouth has remained entirely free of it. In some cases these partial incrustations become so large as to disfigure the cheek outwardly; and, by those not accustomed to this branch of practice, they are sometimes mistaken for diseases of a more formidable nature. They have even been treated as exostoses of the jaw bone.

While the tartar consists of a thin scale only, and as long as it is confined to the external surface of the teeth, and does not  
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prove hurtful to the gums, it seldom meets with much attention: but when it forms in any considerable quantity, it very commonly hurts the gums by producing slight ulcerations upon those parts to which it lies contiguous; or, it insinuates itself between the gums and the alveoli, so as to separate them to a considerable depth from one another. In either of these events, those means should be employed by which we know that it will be most effectually removed.

When the teeth have remained long covered with extraneous matter of any kind, if it has acquired any degree of firmness, it is scarcely possible to remove it without the assistance of instruments. Even a slight discolouring, although it may not be attended with any perceptible covering of an adventitious matter, if it is of long continuance, it can seldom be removed in any other manner. But when once the teeth are thoroughly cleaned with scaling instruments, they may in general be preserved in this state with a very ordi-



nary degree of attention. Frequent washing with cold water; and rubbing them every second or third morning with burnt bread; Peruvian bark; cream of tartar; chalk; or any other mild application in fine powder, will for the most part keep them perfectly clean and white: but this we must observe is not universally the case; for the tendency we have mentioned to a foulness of the teeth, especially to a deposition of tartar, is in some instances so great, that the greatest pains and attention will not prevent the renewal of it. This, however, is not a common occurrence; for we all know, that a due attention to cleanliness will very generally prevent every formation of this kind.

We have said, that when once the teeth have become very foul, they cannot be cleaned without the assistance of instruments. This is at least the best, as it is the safest method. It is necessary however to observe, that the application of acids of a certain strength will in general render the teeth perfectly clean, and even white; for the tartar  
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and other matter that adheres to them being soluble in acids, a frequent use of them will remove it completely ; and we accordingly find, that acids of one kind or another form the basis of almost every wash that has been advertised for the teeth. The public, however, ought to be much on their guard against every application of this kind ; for the teeth themselves are very apt to be hurt by acids, infomuch that it is perhaps impossible to employ any remedy of this nature of a sufficient strength for dissolving any extraneous matter upon them, that will not at the same time prove injurious to the enamel. Every one knows that even the mildest vegetable acid will render the teeth rough, or set them on edge : We may therefore very readily suppose, that those of a stronger nature, the mineral acids, which are very commonly used for this purpose, must prove much more hurtful ; and in fact many have lost their teeth entirely by the use of applications of this kind.

It is indeed said by many, that instruments have done much harm, by hurting  
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the enamel of the teeth, at the same time that they remove the incrustation with which they are covered. This I believe has happened in some instances; but it ought not to be considered as the fault of the remedy, but of the manner of applying it. A sharp instrument may no doubt be applied with such impropriety as to remove the enamel entirely; but this must always be the fault of the operator: for every incrustation to which the teeth are liable may be taken off with perfect safety, and without doing any injury whatever to any part of the teeth.

In Plate LVIII. instruments of various forms are represented for this operation. Figs 2. 3. and 4. are the best, and will answer for most purposes; but the others are sometimes necessary for the removal of such parts of the incrustation as form between the teeth. They should all be moderately sharp, otherwise the operation will be done with difficulty; but the edge of none of them ought to be fine, otherwise it will be apt to turn, and even to break, with the force necessary for scaling off the tartar.

In



In performing this operation, the patient should be placed upon a low seat, with his face opposite to a clear light, and his head supported by an assistant. The surgeon himself should be seated upon a chair somewhat higher. It is commonly indeed done while the operator is standing; but we have elsewhere had occasion to remark, that practitioners ought to sit at every operation when it can be done with any propriety.

The surgeon should now wrap the forefinger of his left hand in a wet cloath, with which he is to press with some firmness upon the point of the tooth intended to be first cleaned, while the back part of the scaling instrument will form a point of resistance for the thumb of the same hand. In this manner the tooth may be firmly supported so as to prevent every risk of its being moved or loosened by the instrument. This in every case is a necessary precaution; but it is particularly so when the teeth are in any degree loose.

The sharp edge of the instrument is now  
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to be insinuated beneath the under part of the incrustation, care being at the same time taken to avoid the neck of the tooth, otherwise, if it be pushed down this length, and if much force be employed, there will be much risk of loosening, or even of turning out the tooth entirely. On being certain that the instrument is properly placed, it must be pushed with some firmness from below upwards to the top of the tooth, and must be repeatedly applied in the same direction as long as any of the incrustation remains either on the outside or inside of the tooth : And one tooth being completely cleaned, all the rest which require it must be treated in the same manner. This being done, the teeth should be all well rubbed over with a bit of sponge in the form of a brush, covered with a fine powder prepared of equal parts of cream of tartar and Peruvian bark ; and this being continued from time to time, it will seldom happen that any farther assistance will be necessary ; but if, notwithstanding of this, the teeth are again observed

served to turn foul, any incrustation that may form upon them must be scaled off in the manner we have already directed.

This is the safest and most effectual method of cleaning the teeth when they become foul from extraneous matter of any kind forming upon them ; but they sometimes lose their colour, as we have already observed, and acquire a kind of foulness, when no matter of this kind is perceptible. Even in such cases, as long as the surface of the teeth remains smooth and sound, moderate friction with the edge of a scaling instrument will frequently prove serviceable ; and if the operation be done with caution, no risk whatever will accrue from it. But when the teeth become black from a cause of this nature, we sometimes find the enamel corroded, or perforated as it were with an infinite number of small holes ; and this, we must observe, is the worst kind of foulness to which they are liable : for it is difficult to remove ; and when removed, it in general soon returns,

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and seldom stops till all the teeth which have been attacked with it are destroyed.

As this kind of foulness cannot be removed with instruments, we are under the necessity of employing some chemical preparations for dissolving it. All the mineral acids will do this in the most effectual manner; but, for the reasons we have already given, they ought never to be used. I have commonly, in cases of this nature, employed saponaceous, or even pure alkaline applications; by which the teeth may be often rendered perfectly clean without any injury being done to the enamel. A strong lather of common soap will often answer; and a solution of salt of tartar applied over the teeth with a small pencil or brush, will on some occasions prove equally successful.

When in this manner the foulness is removed, frequent washing with cold water, and rubbing from time to time with one of the powders above mentioned, are the most effectual means for preventing a return of it. I have sometimes thought too,

that repeated applications of tincture of Peruvian bark have proved serviceable in preventing it. Indeed, as this variety of the affection seems to depend upon some cause of a putrescent nature ; for it is evidently attended with a caries or mortification of the affected teeth ; there is reason to suppose that antiseptics of every kind may prove useful in the treatment of it.

For the purpose of applying powders and other applications to the teeth, brushes of different forms, and various kinds of roots properly prepared, are daily used. Lucerne and alkanet roots, dried and beat at one end into the form of a brush, are much employed for this purpose, and they may be used both with safety and advantage for cleaning the interstices between the teeth : but neither these nor any kind of brush should be employed for rubbing the roots of the teeth and the upper parts of the gum ; for as their points pass in between the gums and the sockets, they are apt to separate the one from the other, from which a good deal of mischief is apt to ensue.

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For this reason, I always employ a piece of sponge fixed on a small handle, with which the roots of the teeth may be rubbed with safety.

## SECTION IX.

### *Of TOOTHACH.*

**T**OOTHACH appears to be more unsupportable than any other kind of pain. It renders those who are affected with it very unhappy; and as it is one of the most frequent diseases to which the human body is liable, it requires much attention from practitioners. The pain induced by toothach, even when it is confined to a single tooth, is often productive of great distress; but this is trifling when compared with the consequences which sometimes ensue from it. Indeed many instances have occurred of the strongest constitutions being ruined by frequent returns of it. Besides  
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the usual symptoms of pain in one or more of the teeth, and of swelling in the contiguous gums; the cheek frequently becomes tumefied; the eye, and even the ear of the affected side, are often attacked with pain and inflammation; and to these, fever, with all its consequences, is apt to succeed.

These symptoms may be induced by different causes, and by affections of the teeth seemingly of opposite natures.

1. They may originate from the nerve and other parts within the cavity of a tooth being denuded, either by external violence, or by the enamel falling off in consequence of becoming carious or otherwise diseased.

2. They may proceed from inflammation, either of the parts within the affected tooth, or of the membrane which surrounds the root of it. And,

3. The teeth and contiguous parts of the jaws are often attacked with very violent pain in consequence of what is usually termed Sympathy; that is, they

often become pained from affections of distant parts, very severe fits of toothach being sometimes induced by diseases of the eye, of the ear, and of the stomach. We shall proceed to treat separately of these causes in the order they are here mentioned,

§ 1. *Of Toothach from the Nerve being laid bare, and of the Various Methods of Extracting Teeth.*

IN whatever manner the cavity of a tooth may be exposed, we find from daily observation, that for the most part it is productive of much pain; and the reason is obvious. Nature, as we have already observed, has provided the teeth with nerves, but at the same time she has given them a very complete covering of bone: When this protection, however, is destroyed, either by accident or disease, it must necessarily follow, that these parts which were not formed for being exposed, will suffer various injuries, not merely from the food and drink finding access to them, but

but from the external air being at all times freely applied to them.

But it is not the mere exposure of a nerve, or the violence employed in laying it bare, which produces pain; it is the consequence of this exposure, the effects which result from it, to which all the distress which ensues ought to be attributed: Of this every practitioner must have met with frequent instances. Thus I have often known the cavity of a tooth laid entirely open by a tooth being broke by a fall or a blow, and no inconvenience ensue from it but a temporary pain somewhat proportioned to the nature of the accident; and it frequently happens that teeth begin to spoil and at last moulder away without any pain or uneasiness whatever. It is therefore evident, that exposure of the nerve alone is not to be considered as the ultimate cause of toothach. It is a certain degree of irritability induced by this exposure which appears to be the cause of it; and to this our views ought to be directed in the treatment of it.

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This irritable state of the nerve may be induced by various causes, and more especially by saccharine, acid, and other stimulating substances contained in food, being frequently applied to it;—by a too frequent use of toothpicks, which may often be traced as the origin of a fit of the toothach;—and by much exposure to a stream of cold air. Exposure to cold, particularly in a damp state of the air, often terminates in toothach by inducing inflammation; but it frequently produces very violent degrees of pain in a tooth already deprived of part of its enamel, when no other symptom of inflammation can be discovered.

These are the most common causes of toothach when the nerve of a tooth has previously been laid bare; and in such circumstances their mode of operating may be easily accounted for; but we cannot so easily explain or suggest a reason for this state of a tooth being such a frequent occurrence, nor does it appear in what manner it is for the most part produced.

duced. The enamel is sometimes broke by falls and blows, and it frequently suffers by attempts to break nuts and other hard substances with the teeth : In such cases the cause is obvious ; for we know by daily observation, that the osseous part of a tooth very soon becomes carious and wastes away on the enamel being destroyed. But how do we account for the most frequent of all causes of toothach, the decay or wasting of the enamel by rottenness, when no evident external violence has been applied to it ? It has been alleged that we may often trace it to a too free use of acids, which are generally known to prove hurtful to the enamel ; and by some it is said that it depends most frequently upon a want of cleanliness in not washing or otherwise clearing the mouth of putrescent particles after meals. Particles of this kind by resting upon the teeth are supposed to be capable of communicating some degree of their own nature to the enamel ; and the affection being once produced in a single point, the

contiguous parts will become diseased, we are told, from the same cause that mortification spreads in other parts of the body.

We will readily admit that a frequent application of acids to the teeth, even those of the mildest nature, will prove hurtful to the enamel, and therefore they should be avoided; and it is equally clear, that the mouth should be regularly washed after meals, not only for preventing that kind of incrustation upon the teeth which we have already considered, but for preserving a sweetness of breath: It does not however appear probable, that the disease of which we are now treating, spoiled or carious teeth, depends upon either of these causes. Were it to originate from a too free use of acids, it ought to affect all the teeth, or at least a considerable part of them, at the same time and in an equal degree; whereas it begins almost in every instance in a very small point or spot, which in general extends much more slowly than it probably would do if the disease proceeded from any cause of this nature. And  
again,



again, with respect to the effect of any putrescent particles lodging upon the teeth, we do not think it probable that this disease can be ever induced by them. A piece of meat remaining in the mouth from one meal to another, may acquire some degree of fetor; but it cannot probably in that short period become so highly putrid as to destroy the living principle in those parts with which it comes into contact. It is a point, however, which may be easily determined by experiment; and from the result of some trials which I made for this purpose, there is reason to suppose that the common opinion with respect to it is ill-founded. A tooth newly pulled was put into the centre of a piece of putrid beef, and after remaining in it for eight days, it was as free from putrefaction as when first put into it, neither the enamel nor internal parts of the tooth being in any degree affected; and the experiment being repeated with teeth which had been pulled for a considerable time, the result was exactly similar. Now, if this

happens with teeth entirely dead, even when totally immersed in highly putrid matter, we may fairly conclude, that a partial application of putrescent particles to teeth still enjoying life and connected with the rest of the body, will not probably have much effect: for we know, that in other parts of the body the vital principle has a considerable effect in resisting putrefaction; and there is no reason to doubt of the teeth being endowed with the same power of self-preservation. But, besides this general argument in support of our opinion, we may remark, that if the common idea on this point was well-founded, those parts of the teeth should be most liable to corruption where particles of food are most apt to lodge; while, on the contrary, those parts of them which are not exposed to this, should seldom or never suffer. Now every practitioner knows that this is by no means the case; for it must be acknowledged, that one part of a tooth is just as apt to become carious as another. The most likely part for food

to rest in is between two teeth; and we allow that the teeth sometimes spoil in these parts, but by no means more frequently than in other parts not so much exposed to this inconvenience.

It does not appear, therefore, that the causes usually supposed to be most productive of carious teeth have much effect, nor do we know of any incidental occurrence to which in particular this affection can be attributed: From all the observation I have been able to make upon it, I think we ought rather to consider it as depending for the most part upon some general constitutional cause; upon some tendency in the system to produce a wasting or decay of this particular part. The cause of this again I shall not pretend to explain; but I think it perhaps equally probable that this rotting of the teeth we are now considering, depends upon some general affection of the system, as that pain in the gout originates from some general cause. Instances no doubt sometimes happen, of teeth becoming carious evidently from



from some particular occasional cause, and especially from external violence breaking or cracking the enamel. This, however, is not a common occurrence: indeed it is very rarely met with when compared with the frequency of carious teeth; a disease which in most instances begins without any evident cause, and which in general has subsisted for some time before being noticed.

But allowing that the opinion we have offered upon this point were admitted, it may be asked, To what purpose will it tend? Will it suggest any difference in the treatment of the disorder? I think it will.—As the pain of the toothach creates much impatience, and is with difficulty submitted to, if the affected tooth is carious, it is in general not only the desire of the patient, but the earnest advice of practitioners, to have it extracted, as being the most certain means of obtaining relief. In violent degrees of toothach, when the other remedies usually employed are found to fail, extraction of the disea-

fed tooth ought certainly to be advised; and in such circumstances no person can be more clearly of this opinion than I am: but I am equally clear, that, in common practice, this is carried too far, and that many teeth are pulled daily which ought not to be touched. In most instances, the pain will be removed immediately on the diseased tooth being extracted: but it very commonly happens that the relief thus obtained is only temporary, and that the caries soon fixes upon some other tooth, which in a short time becomes as much diseased as the first; and this being likewise removed, the disorder often proceeds from one to another, till scarcely any are left. I have met with various instances of this, where almost the whole teeth have been successively taken out, one becoming carious soon after the removal of another. Nor is there even at last any advantage gained by the practice; for, after all the teeth are taken out, the pain in many cases remains equally severe in the jaw itself.

The frequent occurrence of cases of this  
kind

kind tends much to establish the opinion of carious teeth being often a constitutional disease; and it likewise suggests the propriety of less frequent extraction than what in common practice is found to prevail. As we can never at first be certain whether the disorder depends upon a general cause of this nature or not, it is perhaps right in every case to extract the first, and even the second tooth that becomes affected, as soon as the violence of pain renders it necessary: but whenever the disposition is so strongly fixed in the habit that a third or a fourth are soon observed to be diseased, the patient should be always advised rather to submit to a good deal of distress than to extract any more: and it often happens, when he has resolution to submit to one fit of the tooth-ach, and to wait till it is completely over, that he never afterwards, in this tooth at least, feels any return of it. Cases no doubt occur in which this does not succeed; but it answers often enough to warrant the propriety of giving it a fair trial in perhaps every



every instance: Even where it fails, there is no harm done by the trial; and when it is found to succeed, the advantage gained by it is great indeed. For a considerable time, I adopted the common practice on this point in its full extent: Every carious tooth attended with pain I advised to be pulled; but finding in general that no advantage was derived from it, the result being for the most part nearly as I have already described, I was hence induced to attempt a different method; and now, after a patient has had two or three teeth extracted, if the disease still continues to return, I never advise the practice to be pushed farther, unless when the pain is so very severe as to render it absolutely necessary, which is not however often the case. By avoiding exposure to cold during the fit, and by exhibiting doses of laudanum proportioned to the degree of pain, the distress produced by it is at last in general removed; and by due attention to cleanliness, particularly by frequently washing the mouth with cold water, and, when practicable, by

by stuffing the opening in the carious tooth, so as to prevent the air from finding access to it, many have been saved, not only from the pain and distress of pulling these teeth which became first affected, but of losing others, which in all probability would have become carious if the common practice had been followed of extracting every diseased tooth as soon as it becomes in any degree painful.

Having thus endeavoured to show that carious or spoiled teeth are most frequently produced by some general constitutional cause, we shall now proceed to consider more particularly the means to be employed, not only for preventing, but for removing toothach depending upon this cause.

In cases of carious teeth, it has been a prevailing practice to advise the black or mortified spot to be removed with a file, with a view to prevent the disease from spreading: but, so far as my observation goes, it ought not to be adopted; for the diseased part of a tooth can never be removed

moved without exposing those parts which remain to a more free access of air than they were previously liable to; and therefore, instead of proving useful, I have almost universally seen it do harm. In many instances, I have known it induce pain where there was none before; and instead of preserving a tooth, it frequently seems to have the effect of rendering the remaining sound parts sooner carious than they would probably have become if they had not been touched. I am therefore clear, that this practice of filing should be laid altogether aside; and whoever considers the necessary effect of it will probably be of the same opinion. It is evident that the part of a tooth already carious cannot be sensible of pain. For what purpose, therefore, should we remove it? While it remains, it serves in some degree to cover and protect the sound parts beneath, while by taking it off they are left perfectly bare, and apt to be hurt by whatever is taken into the mouth.

When, again, as much of the enamel is removed,



removed, either by caries or external violence, as to form a hollow of any magnitude, we have it frequently in our power to prevent an accession of toothach, by stuffing or stopping up the opening, so as to prevent the air and particles of food from getting access to the nerve. Different substances are made use of for this purpose: such as gum lac, mastich, olibanum, sealing wax, tin, lead, and gold. When the opening made by the disease is large, and especially when it is narrow at the bottom, and wider outwardly, mastich and gum lac, or even a bit of bees-wax, will sometimes answer when none of the harder substances will remain in the cavity: but as they are quickly rubbed down in mastication, they require to be frequently renewed; so that some of the metals are preferable when the form of the opening admits of their being employed, which is always the case when the tooth is much scooped out inwardly, with a small hole leading into it. Gold leaf is sometimes used for this purpose; but nothing an-

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swers

swers so well as common tin-foil. As much of it should be cut off as it is imagined will be needed; and one end of it being pushed into the hollow of the tooth with the instruments, fig. 6. 7. or 8. Plate LVIII. the rest of it should be gradually pressed in till the cavity is completely filled: and this being done, any portion of the tin that may be left should be cut off, when the surface of the whole should be made perfectly smooth by frequent rubbing with the burnisher, fig. 9. of the same plate. But before any attempt is made for stopping a tooth, the nerve should be rendered as insensible as possible; for till this is accomplished, the patient will not be able to bear that degree of pressure which fixing the tin requires. In general the nerve becomes sufficiently callous for admitting of this, merely by the delay of a few weeks from its being first laid bare: but when this does not prove effectual, we may often accomplish our intention by inserting daily into the cavity of the tooth a few drops of oil of origanum or of thyme,

or any other essential oil, by which any slight degree of irritability in the nerve may be often removed, so as to admit of pressure being applied to it with freedom.

We have already observed, that neither tin, lead, nor any hard substance, will remain in the hollow of a tooth unless the opening into it be somewhat contracted. It has been proposed, however, when the opening is of a different form, and when the stuffing cannot be fixed in any other manner, to do it by drilling a small hole through the sides of the tooth; so that when the lead is pressed into it, it may be retained by passing a peg of silver, gold, or any other metal, from one side of the tooth to the other. In a few cases this may succeed; but it will not answer either where the opening is very wide outwardly, or where the sides of the tooth are not tolerably firm; for where the external opening is very wide, even a peg passed through the centre of the stuffing will not keep it sufficiently firm to prevent some parts of the food from finding access beneath it; and,



and, when the remaining part of the tooth is become thin and brittle, it will be apt to break by the means employed for making a hole in it.

When, however, by any of the means which we have mentioned, the hollow of a tooth can be properly stopped, it will not only prove the most effectual method of preventing frequent returns of toothach, but will have some influence in preserving the remaining part of the tooth. I have known various instances of this where spoiled teeth have been preserved for a great number of years, without being productive either of pain or any other inconvenience; but this requires the cavity to be very completely stopped, so as to prevent every possibility of access either to food or drink, or even to air.

When a patient with spoiled teeth has been liable to frequent fits of toothach, besides stuffing them in the manner we have mentioned, he should be as attentive as possible to avoid much exposure to cold: His head should be kept warm by proper

coverings through the night; and he should live in a dry situation. Indeed, a moist atmosphere proves so destructive to the teeth, that people who live in wet situations find it very difficult to preserve them; and I have known various instances of frequent returns of toothach being prevented entirely, by the patient's removing from a damp to a dry situation: Nay this will sometimes succeed when every other means have failed.

By due attention to the means we have mentioned, much may be done in preventing people with carious teeth from suffering so much as they otherwise would do: but, notwithstanding all our endeavours, teeth in this situation are very apt to become painful, and are often productive of much misery; so that the most effectual method of removing it becomes a very important object.

There are some varieties of toothach which we know from experience may be removed by remedies applied to distant parts of the body. Thus when pain occurs

curs in a tooth, as it sometimes does, from inflammation which first began in the ear, it may be more effectually removed by applying a blister behind the ear than by any other means : Or when a foulness of the stomach is the cause of it, a vomit will prove the most effectual remedy. This we shall afterwards consider in a more particular manner. But when toothach proceeds from the nerve of a tooth being laid bare, it will seldom happen that any application will prove useful that is not made directly to the part itself. Bark, electricity, and a variety of nostrums, are frequently employed ; but in this variety of toothach, the only remedies I have ever known any advantage derived from, are, anodynes, corrosive applications, and extraction of the tooth.

In slight degrees of toothach, the pain is sometimes relieved, or even altogether removed, by applying either opium or laudanum directly to the bare nerve : I have known camphor too prove useful, both by itself and when conjoined with



opium; and it sometimes answers in a liquid form, when dissolved in spirit of wine, when it will not succeed in any other way: Ether may likewise be mentioned as a remedy which in this kind of toothach sometimes affords relief; but as these and other applications of a milder nature do not commonly succeed, we are for the most part obliged to employ others of a more active kind, with a view to destroy the nerve entirely.

A long-continued use of any of the strong essential oils will in some cases, as we have already observed, render the nerve callous or somewhat insensible, but they will never destroy it so effectually as to prevent the risk of future returns of toothach. This, however, may be done by remedies of a different kind; by the application of spirit of vitriol or any other concentrated mineral acid; by inserting a bit of lunar caustic into the cavity of the tooth; or by burning the nerve with the actual cautery. But, in using either the lunar caustic or any of the strong acids,  
much

much attention is necessary to prevent the contiguous parts from being hurt by them; for if they be not inserted with much caution, they are apt to spread and to do a great deal of mischief. The actual cautery may, however, be employed without any risk of this kind: but in order to derive any real advantage from it, the hot iron must be pushed farther into the hollow of the tooth than patients in general will allow; for if the nerve be not destroyed to the very extremity of the root, no advantage is ever gained from it; and this being both tedious and painful, we do not find many that will admit of it; but when a proper application of it is agreed to, we may destroy the nerve by it completely. It may be done with a piece of small wire made sharp at the point, or the instrument represented in Plate LVIII. fig. 8. may be employed for it.

It often happens, however, that none of these remedies prove effectual, either from patients not submitting to a due application of them, or from practitioners not

pushing them so far as they ought to do. In this case, when the pain continues violent, we are under the necessity of destroying the nerve in a different manner, namely, by the extraction of the tooth; and this being done, if the tooth be not much spoiled, and if it be not broke in the operation, after the socket is properly cleared of blood, it may be replaced in the manner we shall afterwards mention when treating of the method of transplanting teeth. This will not always succeed, especially in the molares; but in the back part of the mouth it is not so necessary as when the incisores or canine teeth are taken out, when it will often answer: and when a tooth thus replaced becomes firm, it will prove equally useful as before; while, from the total destruction of the nerve, it will not afterwards be apt to produce pain. We shall now proceed to consider the method of extracting teeth.

As the pulling of teeth is a very frequent operation, much pains has been taken to render it as easy as possible; and  
although



although it is still necessarily attended with pain, yet it is now performed both with more ease and safety than it could possibly be in former times, while the instruments employed for it were rude and unmanageable.

It is evident that a tooth may be pulled in different directions: It may either be pulled in a perpendicular direction with respect to its roots; or it may be made to turn upon its axis by depressing the corona or upper part of it, by which the point of the root will be proportionally raised; or a sufficient degree of force may be applied for pushing it out of the socket in a lateral direction.

If these methods of operating were all equally practicable, we would not long hesitate in determining to which we should give the preference. In raising a tooth perpendicularly, it is clear that much less violence must be done to the contiguous parts than by forcing it out in a lateral direction: for as the roots of the teeth are all firmly fixed in bone, they cannot possibly be pressed out laterally, but with such a force

as

as is sufficient for breaking or bursting open that part of the alveolar process of the jaw-bone with which they are surrounded; and as this is in general attended with some laceration, and always with much contusion, of the contiguous soft parts, it is necessarily productive of a good deal of pain: but as all the space we can obtain, even by the greatest wideness of the mouth, will not admit proper instruments for moving the teeth in the back part of the mouth in a perpendicular direction, we are for the most part under the necessity of using such as move them laterally. All the incisores and canine teeth may indeed be taken out in this manner, and even some of the molares, when they are very loose; but when the molares are firmly fixed, no instruments with which we are acquainted will pull them in this direction. Various proposals have been made for this purpose; but although hitherto every attempt of this kind has failed, some farther trials may perhaps render our instruments sufficiently perfect for effecting it.

The

The only instruments which practitioners in former times were possessed of for the extraction of teeth, were different kinds of forceps or tenets, named according to their forms, Hawks-bills, Cranes-bills, &c. and different kinds of levers both straight and crooked. These, however, were rudely constructed, and it was with much difficulty that teeth, firmly fixed were moved by them. In process of time, therefore, various improvements were proposed on them; but few of these being of much importance, we do not think it necessary either to describe them, or to give delineations of them here; and this especially as they may be seen in the works of Garengeot, Scultetus, Hildanus, and other writers of the last and preceding centuries. All that we mean to do, is to delineate those instruments which are approved of by modern practitioners of reputation; to propose such improvements upon these as by experience have been found to prove useful; and to give a detail of the method of using them.

For



For a considerable time past, an instrument termed a Key has been almost the only one employed in Britain for extracting firm teeth, and it is now very generally used in different parts of the Continent. It is delineated in Plate LIX. fig. 1. and 2.

In proceeding to operate with this instrument, if the tooth to be taken out is in the lower jaw, the patient should be seated in a chair, opposite to a clear light, while his head should be supported by an assistant standing behind; but if it be in the upper jaw, he should be seated upon a pillow, and his head being turned back, must be supported upon the knees of the operator, who in this case must stand behind him, whether the tooth be in the right or left side of the jaw: but when a tooth is to be extracted from the lower jaw, if it be on the right side, the operator should be placed somewhat to the left; and, vice versa, when the tooth is on the left side, the surgeon should place himself on the opposite side. With a view to admit of as free an application of the instrument as possible,

fible, as well as to prevent the gums from being lacerated, all the soft parts adhering to the teeth should be slowly and cautiously separated from it, by insinuating between them the point of the scarificator, fig. 1. Plate L.; and this being done, the operator must proceed to the application and use of the key. The patient having cleared his mouth of blood, the point of the claw *B*, Plate LIX. fig. 1. must be pressed as far down between the gum and the tooth as possible; and in this situation it must be firmly fixed and retained by the fore-finger of the left-hand, while the fulcrum *C* being placed as far down as it will go upon the gums on the opposite side of the tooth, the operator must now with his right-hand apply such a force as he may find necessary for moving it; and by turning the hand sufficiently round, almost any tooth may be taken out at one pull without raising the instrument: but whenever a tooth is found to be very firmly fixed, and especially if it be one of the large molares, whose roots diverge considerably, it is better,

better, after it is freely loosened, to remove the instrument; and having turned the claw to the opposite side, to apply it so as to turn the tooth to the other side of the jaw, by which it will be rendered so completely loose as to be easily taken out with the common teeth forceps, Plate LXI. fig. 3.

In using the key-instrument, when the tooth to be taken out is firmly fixed, and especially when there is little or no vacant space between it and the contiguous teeth, some attention is necessary to prevent these from being loosened. When it cannot be prevented in any other manner, the edges of the tooth to be removed should be filed down with a very thin file, which may be done without hurting the neighbouring teeth, by using an instrument that is quite smooth or polished on one side.

This I believe to be the best method hitherto known of extracting firm teeth from the back part of either of the jaws; and the incisores and canine teeth may likewise be pulled in the same manner: but



these, namely, all the fore-teeth, as well as loose teeth in every part of the jaw, may be pulled in a different manner, which we shall afterwards describe.

Although there is some difference, as we have already observed, between the outer and inner plates of the alveoli of the teeth with respect to strength; yet this is so inconsiderable, that in pulling a tooth it merits little consideration. Neither is it a matter of much importance to attend to the direction of the roots in the molares: For although it is alleged by some, that these teeth may be turned with most ease towards the inside of the mouth, from their roots spreading in general towards the outside of the jaw; yet this is by no means the case. For the most part, the roots of the large molares diverge equally towards both sides of the jaw; so that in this respect they may be pulled with the same propriety to the one side as to the other. But the two last molares of the lower jaw afford an exception to this; for they are so situated, that in every instance where the  
common

common key is employed, they should be turned inwards. The basis or origin of the coronoid process forms a strong sharp ridge on the outside of the jaw, exactly opposite to the roots of these teeth; so that when they are turned outwards, as the heel of the instrument must rest upon this ridge, the gums which cover it are necessarily much bruised and lacerated. As this is seldom attended to, I have seen various instances of much mischief being done by it. When a tooth is much spoiled on one side, it is almost the universal practice in pulling it, to fix the point of the claw on the sound side; and as this is considered as necessary, it may be given as a reason for our being obliged in some instances to turn even one of these teeth we have mentioned towards the outside of the jaw. It is not, however, by any means necessary that this should be universally adopted: for although in general it is supposed to answer best to fix the claw of the instrument on the soundest side of a tooth, and to turn it to the opposite side; yet with

a very little pains and attention we might perhaps in every instance follow the very reverse of this with equal success: for with a proper application of the scaricator we may almost always separate the gums so effectually as to be able to press the point of the claw far down upon the root, so as to turn it with ease to the opposite side.

The key-instrument, however, may be made so as to turn even the two farthest back molares outward, without doing any injury to the gums lying above the process we have just mentioned. A form of it for this purpose is delineated in Plate LIX. fig. 3. which I proposed several years ago, and which I have often used. By the heel of the instrument resting upon the gums beneath the first great molares, while the claw is bent in such a manner as to apply to the two posterior teeth, they may in this manner be turned out with safety. The heel should be made long, so as to pass far down upon the gum; otherwise, for this particular purpose, it will not answer so



well. Indeed the heel of the key-instrument should be always longer than it is usually made; for when it is short, it acts with much less power, and is more apt to break the tooth, than when it is made of a greater length. The contrary of this I know has been much inculcated; but after having given a fair trial to both methods, I am now convinced that the key with a long heel is much preferable to the other. The principal objection that has been raised to the use of a long heel is, that it must bruise the gum more than when a short one is used. This, however, is not the case, as will be readily allowed by any who attentively considers the subject: For even the shortest heel must press upon some part of the gum; otherwise, if it be applied upon the tooth itself directly opposite to the point of the claw, as some have advised, it will act in nearly the same manner, and with no further power than the common forceps: While again, a long heel does not, as is commonly imagined, injure the gums in proportion to the length

length of it: for although the flat side of it be applied to the gum at first, as soon as it begins to act the farthest extremity of it only will be found to touch them; and accordingly this part of the heel, as well as all the rest of it, should be made as smooth as possible; so that in turning upon the gum, it will do less mischief than when it is made rough according to the usual form.

We have already observed, that in the pulling of teeth there is no cause for being attentive to which side they are turned, from any difference of strength between the outer and inner plates of the alveoli or sockets; for in this respect they are nearly similar. But even although the difference was greater than we find it to be, it should not be regarded; for in pulling a tooth in the manner we have described, namely in an oblique or lateral direction, it is evident that the socket must be broke on both sides of it; at least this must be always the case where the roots of the tooth are of the usual length, and not shortened, as they

sometimes are, by disease; for while the corona of the tooth is forced down upon one side of the socket, the point of the root must necessarily be turned in nearly the same proportion upon the other. The softer parts will not indeed suffer so much, as they will not be bruised by the heel of the instrument; but it is clear that the socket must be always much hurt by it: so that in every point of view, little or no consideration is due in this operation to any difference that is supposed to take place in the strength of the two plates of which the sockets of the teeth are formed.

But as it is of much importance to save both sides of the alveoli as far as is possible, nothing should be omitted that can with any propriety be done to protect them. For this purpose a form of the key instrument has been proposed, by which it is intended to support the gums and alveoli; while at the same time the tooth is raised and separated from them, by turning the instrument in the usual manner. But if the socket be so effectually supported as to  
prevent



prevent it from yielding on the tooth being pressed towards it, there is much reason to fear that the tooth itself will break; and if the instrument be not applied in such a manner as to have this effect, it will answer no other purpose than the key in common use; while, being more complex, it is managed with more difficulty. The proposal, however, is ingenious, and may lead to improvement in the operation of tooth-drawing\*.

In pulling a tooth with the key-instrument, it is the common practice to force it out at once. But although this may often succeed, it is by no means advisable: for when the roots diverge much, or when any portion of the fang is enlarged, as is sometimes the case, we run a great risk, by this method, of breaking them, at the same time that the socket must be much more broke than when the tooth is loosened in

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\* This instrument is the invention of Dr John Aitken. For a more particular account of it, see *Essays on several important subjects in Surgery.*

the manner we have directed, by turning it first to one side and then to the other with the key-instrument, so as to be able afterwards to take it out with the common forceps. And if this be done slowly, with a gradual equal pressure, and if the heel of the key has been properly covered with several plies of soft old linen, scarcely any mischief of importance can be done by it; But instead of this, when the hard instrument is applied directly to the gum, without the intervention of any soft substance, and when the tooth is turned out, as is usually done, by a sudden jerk, the gums will not only be greatly bruised and lacerated, but the socket will be much more broke, at the same time that the tooth itself will run a much greater risk of being broke than when pulled in a more gradual manner. It is natural for patients who are ignorant of the risk attending it, to wish for the operation to be quickly done; but it is unpardonable in practitioners to indulge them in this, when a moment's reflection must convince them, that it can  
feldom

seldom be done but with much risk of breaking either the jaw or the tooth.

Even when the operation is done in the most cautious manner, troublesome accidents will sometimes occur from it : And these particularly are, bruising of the gum; splinters of bone being separated from the jaw; and alarming hemorrhagies.

Laceration or even bruising of the gum being a very painful part of the operation, it should be prevented as far as possible, not merely by covering the heel of the instrument in the manner we have advised, but by avoiding the application of it altogether, when it can possibly be done, while the gums are much inflamed : for while the inflammation continues, the operation proves necessarily much more hurtful than it otherwise would do. For obviating the effects of laceration, when any small portion of gum is much separated from the rest, it should be cut off with a pair of scissars; the mouth should be fomented from time to time with warm milk or any emollient decoction; and



when there is reason to imagine that sup-  
puration will take place, it should be en-  
couraged by the application of roasted figs  
by way of cataplasm. In this manner, if  
an abscess occurs, it will be soon brought  
to maturation; when, if it does not soon  
burst, it should be opened: And again, in  
cases of slighter contusions, nothing alle-  
viates the pain induced by them so effec-  
tually as the applications we have men-  
tioned.

When the bone happens to be splinter-  
ed, if it is the socket merely that has suf-  
fered, very little uneasiness will probably  
ensue from it; and therefore it is scarcely  
necessary to mention it even to the patient.  
But when the splinter extends to the more  
solid part of the jaw, which in children  
especially is apt to happen, if the operation  
be not done with the utmost attention, as  
the sore which ensues proves commonly  
tedious, and as it will not readily heal as  
long as any loose pieces of bone remain in  
it, any of these that are perfectly detached  
should be taken away immediately; but

as they are seldom so completely separated as to come away easily at first, no force should be used in it, as they will afterwards either fall out of themselves, or will be taken away without any difficulty, on a free formation of matter taking place. After this, if the matter be prevented from lodging, and if the constitution is in other respects sound, the sore will probably heal with ease.

Hemorrhagies of much importance do not frequently occur from tooth-drawing; for the blood vessels which supply the teeth being small, it is scarcely possible that much blood can be discharged by them. But when the roots of teeth are deeply fixed in the jaw, and when much force has been used in the operation, we can easily suppose that in this manner some of the larger arteries of the parts may be divided; and it is thus I imagine that any troublesome hemorrhagy which occurs here is ever produced. At first we advise the patient to take frequent mouthfuls of cold water, red wine, brandy, vinegar, or even alcohol;

alcohol; and for the most part one or other of these will prove successful; but when they happen to fail, other means must be employed, and the easiest of these is compression. A doffel of soft lint being fitted to the opening, must be pushed into it; and the patient being desired to make a constant pressure upon it, by keeping the mouth shut, if this be persisted in for a sufficient length of time, it will very rarely fail. I have met with instances, however, even of every trial of this kind proving unsuccessful, and of fainting and other disagreeable symptoms occurring from the violence of the hemorrhagy. In such a situation the actual cautery is alone to be depended on; and it must be applied with freedom, otherwise no advantage will be derived from it. A small bit of lunar caustic inserted into the opening might in some cases answer the same purpose; but it does not act with such certainty as the other, while at the same time there is a greater risk of mischief being produced by it,



it, from its being apt to spread so as to injure the contiguous sound parts.

The key-instrument which we have recommended, is perhaps the best hitherto invented for the pulling of teeth in an oblique or lateral direction; but there are several others which are used in different parts of Europe that act nearly on the same principles: These, however, being less perfect, will not all be delineated here; but with a view to convey some idea of them to such as may not have an opportunity of seeing them, I have given a representation of two of them in Plate LX. figs. 1. and. 2. But even these, although they are the best I have met with, are very inferior to the key: for they act with much less power; and they have this great defect, that they can never be employed for pulling teeth towards the inside of the mouth.

We have thus described the method of extracting firm teeth from the back part of the mouth. Any of the fore-teeth may likewise be pulled, as we have already observed, with the same instruments; for they  
may

may be turned either inwards or outwards by a proper application of the key: but they may also be pulled in a different manner; and as this may be done with instruments which do not bruise the gums, it should perhaps in every instance be preferred.

The incisores and canine teeth, and even the two small molares, have only one root; so that they are never so firmly fixed in the jaw as the large grinders; and therefore they may be extracted with more ease. For the most part this may be done with the common teeth-forceps represented in Plate LXI. fig. 1. 3. or 4. In using this instrument, it should be pressed as far down upon the tooth as possible, otherwise it is apt to break off the corona or upper part of it, and to leave the root; and the tooth should not be pulled directly upwards, but should be twisted alternately from one side to the other till it becomes loose, when it may be taken out without further trouble.

In some cases, however, even these teeth are too firmly fixed to admit of their being  
pulled

pulled with this instrument: we have therefore given a representation of forceps that act with more power; a very ingenious invention that was first made public in the British Magazine in the year 1762. It is delineated in Plate LXII figs. 1. and 2. Fig. 1. represents a common strong forceps with moveable claws. The axis of the claws is shown at *A*. Fig. 2. is a fulcrum. *B, C*, is the handle going off obliquely from *B*, by which it is more easily applied. *B, C, D*, is a plate of iron covered underneath with a piece of soft buff; and *E* is the other side of the same plate made round, smooth, and uncovered. The tooth intended to be pulled is laid fast hold of with the forceps, fig. 1. then the fulcrum *B, C, D*, is placed upon the neighbouring teeth, when the forceps being placed upon the round part of the plate *E*, by a proper motion of the lever *F, G, H, I*, the tooth is in this manner to be extracted. In the pulling of loose teeth, this instrument may be used so as to draw them nearly straight up; and this we are told may even be done



where the teeth are quite firm, provided their roots do not diverge much, and that there be no osseous adhesions between them and the sockets : but with a view to prevent any bad consequences that might occur from the application of much force, we are desired by the anonymous author of the instrument, instead of attempting to pull firm teeth directly upwards, to twist them a little outwards, which loosens them so much, that they may then be pulled almost in a perpendicular direction with much ease.

The advantages supposed to be derived from forceps with moveable claws is this : When the common forceps is used with immoveable claws, if the tooth be firm it must either be forced out obliquely, or the first hold must be lost, and the instrument fixed again : but when the claws are moveable, it will always retain its hold, and the tooth will be pulled nearly in a perpendicular direction ; for the claws, by turning upon centres, will always fall into the way  
of

of the tooth; and will therefore raise it very nearly in a straight line.

We have taken different opportunities of observing, that the most painful part of tooth-drawing arises from the bruising and laceration of the gums and sockets, a circumstance which cannot be altogether avoided when the key-instrument is employed. The great object of the forceps we have just been describing being to pull in a straight direction, by which the gums and sockets are almost entirely saved, would render it the most complete instrument that has hitherto appeared, were it not liable to some very material objections. The ingenious author of this forceps thinks it may be employed for the extraction of any teeth; even of the large molares: but, as the mouth cannot be so widely opened as to admit of the proper application of it, this should never be attempted. It must therefore be confined, as we have already observed, to the pulling of teeth in the fore part of the mouth. But besides this, as the fulcrum is placed upon the contiguous

ous teeth, when the tooth to be pulled is firmly fixed, it is scarcely possible to prevent those from being hurt: for they will be very apt to suffer even when the pressure is made as nearly as it can be done in the direction of their roots; and when this is not attended to with much exactness, they are apt to be broke, or even to be forced entirely from their sockets. In the pulling of all loose teeth, however, and whenever it is found that the fore-teeth are not so firmly fixed as to require much force to move them, this instrument may be employed with much advantage. When, again, it is discovered upon trial, that an unusual degree of force is necessary, a prudent practitioner will rather lay the forceps aside, and finish the operation with some other instrument. The common key, as we have already observed, may be used; or either of the instruments, figs. 1. and 2. Plate LX. may be employed for loosening the tooth; after which it may be taken out either with these or with the common forceps.

We



We have hitherto been supposing that the tooth to be pulled is only carious in a particular part, and that a considerable part of the corona is still remaining. When a tooth becomes so much diseased that the upper part of it falls entirely off, so as to leave little, or perhaps nothing, above the gums, the remaining part of it is thus reduced to what is commonly termed a Stump.

In this stage of the disease, the connection between the remaining roots and the sockets undergoes a very important alteration. By the corona being removed, the roots, whatever number there may be of them, are all separated from each other; for as they are united solely through the intervention of the corona, it is evident that their connection must be destroyed immediately on this being taken away. In this manner their connection with the sockets is rendered not so firm as when diverging roots, tied together above, tend all to support each other; but they become still more loose by a dissolving or

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wasting process, to which teeth in this situation are particularly liable. A considerable part of the corona of a tooth may become carious, and fall away, without any effect being produced upon the roots; but I have scarcely known an instance of the corona being completely removed for any length of time, where the roots did not suffer a remarkable diminution. Nay, in some cases, the roots, even of the largest molares, have been almost completely annihilated; and instead of the long fangs with which these teeth are furnished, only a small point or two of spoiled bone has been met with. In consequence of this they become loose; and their connection with the jaw being now very superficial, they may be forced out much more easily than it is possible to extract a large tooth. I know that practitioners in general are of a different opinion, the pulling of a stump being for the most part considered as a more difficult as well as a more painful operation than the extraction of a large tooth. This, however,

ever, can proceed only from want of experience in this branch of practice; for those who are more versant in it know well, that there is much more pain, hazard, and difficulty, in the pulling of a complete tooth when firmly fixed, than in the taking out of several stumps.

When the point of the claw can be forced so far down upon a stump as to get a firm hold, it may be pulled with the key-instrument in the manner we have advised for the extraction of large teeth; but this should not in general be advised, as we may commonly employ a sufficient force with instruments which do no injury to the gums, and by which a very painful part of the operation may be avoided. When the stump can be laid hold of either with the common forceps or with those with moveable points, this will be the easiest method of pulling it: but when it is so much spoiled as to be nearly, or perhaps entirely, covered with the gums, the points of the forceps cannot be pressed sufficiently down upon it; in which



case, we are under the necessity of forcing it out with a simple lever. This instrument is commonly termed a Punch : different forms of it are represented in Plate LXIII. figs 1. 2. and 3. In using it, the gums must be freely separated from the stump with a scarificator; and the point of it being pressed down upon the root, a degree of force must be applied sufficient for raising it completely out of the socket: and this being done with one of the fangs, the instrument must be applied in a similar manner to the rest of them.

With those accustomed to the use of the punch, this operation is simple and easy, while with others it is often both difficult and tedious. In order to be able to apply as much force as possible, the point of the instrument is commonly pushed as far as it will go towards the root of the fang: But by this means much of the force that is employed is lost against the alveoli of the opposite side, which being firmer and stronger towards the base of the jaw, they do not so readily yield at

this part as where they are thinner and not so firmly supported. In general, it will be found to answer better to push the instrument no farther down upon the fang than is merely necessary for procuring a sufficient rest for the point of it; for I know from experience, that a stump may be forced out in this way with much more ease than in any other manner. When it does not come out at once with the punch, but is merely loosened by it, it may in this state be laid hold of with the forceps, and removed in the manner we have already pointed out.

For the most part, a punch of such a form as is represented in Plate LXIII. fig. 1. answers best. With this the force is applied so as to push the fang towards the opposite side of the jaw; but it sometimes happens that the upper point of the root is of such a form as does not so readily admit of force being applied to it in this direction: in this case we employ a kind of hook or crooked lever, such as is represented in fig. 3. by which the

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stump

stump is drawn or raised in a contrary direction.

I have thus described what by experience I have found to be the surest and easiest method of extracting teeth. A variety of instruments may indeed be met with in other authors, which I have not mentioned, and by which it is said, by the inventors of them, that the operation may be done with more ease. But this not being supported by the result of practice and observation, it will not be expected that I should give any account of them.

§ 2. *Of Toothach from Inflammation.*

THE ordinary symptoms of toothach arise, for the most part, as we have already remarked, from the nerve being laid bare, either from a tooth becoming carious, or from the enamel being broke by external violence. It sometimes happens, however, that it occurs in a very violent manner merely from an inflamed state of the membrane surrounding the root of a tooth,



tooth, or from the parts within the body of the tooth becoming inflamed. We judge of this being the cause of the affection, when a severe permanent pain attacks a tooth which appears perfectly sound outwardly: and this especially when it has been evidently induced by much exposure to cold; or when it is connected with other symptoms of inflammation, such as an inflamed state of the contiguous cheek, swelling and suppuration in the adjoining gums, &c.

In most instances, we may be able to trace this variety of toothach to the cause we have mentioned, exposure to cold; in some cases, however, it proceeds from causes of a different nature. Whatever will produce inflammation in other parts of the body, will be attended with the same effect when applied to the membrane which surrounds the root of a tooth: and we know from experience, that inflammation of this membrane is sometimes induced by a disease to which the roots of the teeth are liable; what is termed the Swelling

of the Fang, a hard knot or exostosis which now and then forms at the point of the root. At first, the pain induced by this may be supposed to originate from distension alone; but ultimately it commonly terminates in a very severe degree of inflammation. And inflammation of these parts, by whatever cause it may be induced, is always attended with a more violent pain than what commonly takes place from similar affections in other parts, owing to their being here surrounded with bone, which prevents them from yielding so readily to that distension of the vessels with which inflammation is always accompanied.

In the treatment of this variety of the disease, we will find in general, that those remedies prove most successful which answer best in inflammatory affections of other parts. Local blood-letting, either by scarifying the contiguous gums with a lancet, or by the application of leeches, often gives relief. I have known the pain removed entirely by the application of a  
blister

blister directly opposite to the part affected: and much advantage is often derived from a large dose of laudanum; for, by procuring a temporary diminution of pain, it thus lessens irritation, and hence an abatement of the inflammation itself. The head should be kept warm by covering it completely with flannel; a practice which should be inculcated with all who are liable to toothach, from whatever cause it may proceed, but particularly when it originates from inflammation; and in this case fomenting the head with the steams of emollient herbs, or even of warm water alone, will often procure relief when every other remedy has failed. In some cases indeed, cold water, vinegar, or ardent spirits taken into the mouth, prove serviceable; but for the most part warm applications prove more useful in this variety of toothach.

By a due perseverance in the use of one or other of these remedies, the pain will commonly be at last removed; and in toothach arising from inflammation, we  
are



are particularly induced to persevere in applications of this kind, from our knowing that the disease is not apt to return after it is once entirely removed. But when they do not prove successful, we are then under the necessity of advising the extraction of the tooth, which we often find is the only remedy to be depended on. In extracting a firm tooth, we have already advised it to be done in a slow gradual manner in every case, with a view to prevent the tooth from breaking, and the jaw from suffering so much as it is apt to do when a tooth is forced quickly out. This caution, however, is more particularly necessary in the extraction of teeth under the circumstances we are now considering; for when the pain originates merely from inflammation, without any part of the tooth being spoiled, the roots are always entire, and more firmly fixed, than when the corona of a tooth is mostly consumed, and when the roots are always in some degree decayed. And besides, when the pain and inflammation are induced, as we have  
already

already remarked, by a swelling or enlargement of the fang, and which can never be previously discovered, if the tooth be turned quickly round, it will for certain break; and the swelled part of it being left behind, scarcely any advantage will be derived from the operation, while all the pain and distress with which it is usually attended will be severely felt by the patient.

On pulling a tooth which does not appear to be carious in any part of it, we are advised by some practitioners to replace it, and to tie it to the contiguous teeth till it becomes sufficiently firm. This I have done in different instances; but I think it right to observe, that it is a practice which frequently fails, owing, I presume, to the experiment being tried with teeth in a state of inflammation. I know it will often succeed where a tooth has been merely productive of pain, and when no symptoms of inflammation have taken place; but whenever the membrane surrounding the roots of the teeth, or even  
when

when the contiguous parts only are much inflamed, it will seldom or never succeed, while at the same time the trial of it will always be productive of much pain and distress. It ought not therefore to be advised indiscriminately in every case, as has frequently been done.

§ 3. *Of Toothach arising from Affections of distant Parts.*

It is no uncommon occurrence in practice to find all the symptoms of toothach produced in the most severe degree, in one, two, or more teeth, where we cannot by the most accurate examination discover the least appearance of disease; where we are therefore certain that no part of them is carious, and where there is every reason to conclude that the disease does not originate from inflammation.

In such circumstances, as the patient is at first always unwilling to part with a tooth which in other respects appears to be sound, all the remedies usually employed  
in



in toothach are made use of; such as blisters,—blood-letting with leeches,—the application of ardent spirits and strong essential oils to the pained part, &c.; and after being for some days tormented with these, without any advantage being derived from them, the pulling of the tooth is recommended as a never-failing remedy. Even this severe alternative is at last submitted to; but unfortunately no benefit ensues from it. The tooth in which the pain seems to be most severe is first taken out: But the contiguous teeth becoming soon pained in an equal degree, they are from time to time all taken out, till at last I have known all the teeth of one side extracted, and still the pain continue equally severe in the jaws and gums as at first.

In such circumstances, we will often find, that the pain in the tooth is induced by an affection of some other part, and that no remedy will prove effectual that is not directed to the original disease. It originates in some instances from rheumatism;—it has been known to proceed from

from an arthritic diathesis;—it occurs as a frequent symptom in hysterical affections;—pregnant women are frequently liable to it;—and it is often found to depend upon a foul state of the stomach.

When the pain originates from a foulness of the stomach, which may be often known by the state of the tongue, as well as other circumstances, no remedy proves so effectual as emetics. I have known the most violent toothach, which for many weeks had resisted the effects of every other remedy, almost instantaneously removed by a vomit: and when the stomach is once sufficiently cleared, a plentiful exhibition of Peruvian bark proves often effectual in preventing a return of it; particularly where the fits of toothach have returned periodically, as they sometimes do, so regularly as to give cause to imagine that they depend upon a tendency to ague.

In this variety of toothach, arising from an affection of the stomach, no benefit is derived from laudanum. Instead of procuring ease, it seems rather to in-

crease the pain, and, by inducing sickness, to render the patient in every respect more miserable. But in these varieties of the disease, originating either from rheumatism, from gout, or hysterical affections, opiates will for the most part remove the pain entirely; and a return of it may be frequently prevented merely by keeping the parts sufficiently warm. In hysterical patients, a combination of laudanum with ether proves sometimes useful, when opiates in every other form fail entirely.

In that species of toothach which pregnancy seems in many instances to induce, opiates too are often prescribed; but seldom with much advantage. In large doses indeed they sometimes procure a short relief from pain; but nothing I have ever tried proves so effectual in preventing a return of it as blood-letting. A plentiful discharge of blood, by the application of leeches to the neighbouring gums, will sometimes answer the purpose; but as the pain in cases of this kind seems to originate



nate from a general plethoric state of the system, it commonly proves more effectual to empty the vessels by taking away eight ten, or twelve ounces of blood, from the arm. I have known women immediately relieved by blood-letting, who for several weeks had been liable to very violent degrees of toothach, and in whom neither tooth-drawing, opiates, blisters, nor any other remedy, were productive of any advantage.

When a practitioner finds that he has pulled a tooth in the circumstances we are now describing, where there is neither inflammation nor much caries, he may with much propriety venture to replace it. After clearing the tooth and socket entirely of blood, it should be put as nearly as possible into its natural situation; where it should be tied to the two contiguous teeth till it becomes sufficiently firm.

## SECTION X.

*Of TRANSPLANTING TEETH.*

THE advantages of a found set of teeth, both with respect to beauty and utility, are so considerable, that we need not be surpris'd to find the fertile genius of modern artists employed in endeavouring to supply the loss of those which accident or disease may have occasioned. The method of supplying deficiencies of this kind with artificial teeth, and even of making complete sets of them, has been long known, and the art has by many dentists been carried to great perfection; but the transplanting of human teeth from one living body to another is the invention of modern artists. The mere proposal of such a nice operation was intitled to much credit; and in no instance does the art of surgery appear to more advantage than in rendering the practice of it perfect. It will

readily be conceived, however, that it is not admissible in every case. Various circumstances must concur to render it practicable ; but it may commonly be done wherever it is very necessary.

1. As it is in general more with a view to obviate deformity, than to be productive of any real advantage, that the transplanting of teeth is practised, it is seldom considered as necessary with any of the large molares. Indeed with these teeth it could not often take place ; for as the roots of them often diverge in a very uncertain manner, and as the number and length of the roots can never be previously determined, it would for the most part be impossible to procure teeth exactly fitted to the vacancies intended to be filled up. The practice is therefore confined almost entirely to the incisores and canine teeth, although it may be done with nearly an equal certainty in the small molares ; for in them the roots are either single, or if there are two fangs they are almost always united.

2. In order to ensure success, the alveoli  
and



and gums must be perfectly sound. They must be free from scurvy and the lues venerea; nor must the patient undergo this operation for a considerable time after a salivation. The use even of a small quantity of mercury frequently leaves such a soft spongy state of the gums, as renders it improper during the continuance of it to attempt any operation upon them. Hence those who are to have teeth transplanted, should carefully avoid even the risk of contracting any complaint for the cure of which mercury may be necessary\*. A patient being liable to gum-boils has been considered as an objection to this operation; but where every other circumstance concurs to render it proper, it should not be forbid by this: for although it would not probably succeed where the surrounding socket is carious; yet we know that gum-boils frequently occur where the socket is not in any respect diseased.

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\* This caution is particularly inculcated by the very ingenious Mr John Hunter, in his Treatise on the Diseases of the Teeth, page 98.

3. As the success of the operation will depend in a great measure not only on a sound state of the alveoli, but on the sockets being full and complete, it will seldom answer where teeth have remained long in the state of stumps: for in this state the roots commonly waste away so as to lose considerably both of their length and thickness; and the alveoli diminishing in nearly the same proportion, there is not sufficient space left for the roots of a sound tooth to be fixed in. It may always, however, be attempted where any considerable part of the corona of the tooth is left; for in this case the roots, as we have formerly remarked, are usually found complete, however extensively the caries may in other respects have spread.

4. It is in youth and middle age only that this operation is admissible. In childhood and old age it should not be attempted. In childhood it is not probable that a tooth put in, in this manner, would ever become firm, as the approaching tooth of the second set would always be acting  
against

against it; and besides, as any vacancy produced at this period will be filled up when the second set comes forward, it can never be in any respect necessary. In old age again, two strong objections occur to it. At this period the sockets of the teeth are commonly much diminished, particularly in depth: and in old age, when many of the smaller blood-vessels become obliterated, it is not probable that any transplanted tooth, whether taken from a dead or a living subject, would ever become sufficiently firm: For, when the operation succeeds, as there is always a firm union produced between the tooth and the contiguous parts, by means of blood-vessels passing from one to the other, we are led to imagine that this is necessary for the success of it. Now this, for the reason mentioned above, can never happen to any extent in advanced periods of life.

5. The transplanted tooth ought to fit the socket in every point as exactly as possible: but it should not require much



force to insert it; for if it be in any degree larger, either in length or thickness, it will create a great deal of unnecessary pain. The irritation produced by it will probably terminate in suppuration; and in this manner the operation will prove entirely abortive. Several people therefore should be always provided for the purpose of furnishing teeth; so that the operator may have no difficulty in finding one of a proper size: and it will frequently happen, that a tooth of the same size taken from one person will fit the socket of the same tooth in another person very exactly. When it is found, however, that the roots of the tooth newly pulled are either too long or too thick for the socket in which they are to be placed, they should be filed down till they go easily in; for it is not found that the removal of a small part of the root prevents the success of the operation. And care should be taken to make the surface of the transplanted tooth somewhat lower than the level of the contiguous teeth, so that no inconvenience

venience may occur from those in the opposite jaw pressing against it. There is no necessity, however, for this difference being so considerable as to be very perceptible; for the smallest difference will answer the purpose, and a greater degree of it will always be attended with some deformity.

But although we have said that the roots of teeth to be transplanted may be lessened with a file, no part of the corona should be touched with it. It is sometimes indeed done by dentists, and it may in some instances succeed; but as it must always be attended with some risk of the tooth becoming carious, it should never be advised; and this especially as a very little attention will render it at all times unnecessary: for although we may be mistaken with respect to the size of the roots of a tooth, we have it always in our power to determine with exactness, whether the upper part of the tooth to be pulled will fit the vacancy or not.

6. In taking out the new tooth and re-

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moving

moving the old one, much care and attention is necessary; for if the new tooth be much broke, or if the socket in which it is to be placed be much injured, the operation will not probably succeed. When it is possible therefore to take out the old tooth with the forceps, it is better to do it in this manner than with the key-instrument, which can scarcely be used without injuring the parts too much.

7. When the tooth is removed, the socket cleared of blood, and the new tooth inserted under the restrictions we have mentioned, we are next to endeavour to keep it firmly fixed till an adhesion sufficient for retaining it takes place between it and the neighbouring parts. This must be done by tying it to the two contiguous teeth, and by much attention on the part of the patient to do nothing that can probably loosen it. In transplanting a canine tooth, the ligature, which should be made of several plies of fine silk properly waxed, should be first tied round the upper part of the new tooth, immediately above where



it begins to swell; and on the tooth being properly placed, it should be tied to the two contiguous teeth, taking care to pass the ligature as near as possible to the gums. But when the incisores or small molares are transplanted, it answers better to fix the ligatures first to the contiguous teeth near to the junction of the gums, and then to pass them over the surface of the new tooth, and bringing them again back, to fix them where they commenced, round the necks of the other teeth. In this manner the transplanted tooth is pulled down by the ligature into the socket; but much attention is necessary in this part of the operation to prevent it from being drawn too much either to one side or another; for nothing more certainly prevents the success of it than the new tooth being made to press upon either of the contiguous teeth. This, however, will never happen in the hands of an expert artist who has been sufficiently accustomed to this branch of practice; nor can it happen with  
any

any who is properly warned of the consequences that may ensue from it.

When the ligatures are properly fixed, they may not perhaps need to be renewed; but when they either slip off accidentally, or become in any degree loose, they should by all means be renewed immediately; and the patient should be constantly on his guard to avoid whatever might in any degree loosen or shake the tooth. Nor is it sufficient to attend to this for a few days only: the same kind of caution must be persisted in till the tooth becomes perfectly firm; and the length of time necessary for this will depend on the circumstances of every case; on the particular state of the alveoli; on the age and habit of body of the patient; and on the operation being done with more or less exactness. In some cases a tooth will become perfectly firm in the space of eight or ten days; while in others it will remain somewhat loose for two or three months. During all this period the patient should live as much as possible upon spoon-meat: and he should  
guard

guard particularly against cold; for nothing renders the success of this operation liable to so much hazard as exposure to cold or dampness.

The most important objection that has been started to the transplanting of teeth, is the risk with which it is attended of communicating diseases; and I must own that *à priori* it appears to be a very material one. It has not however been found on experience to be sufficient to counterbalance the advantages which are supposed to be derived from this operation: for it is daily practised; and we seldom hear even of any suspicion of infection being carried into the system by it. I am not, however, of opinion with those who think that diseases cannot be communicated in this manner. On the contrary, I think those practitioners do not deserve to be employed, who treat a matter of such importance to their patients, with indifference. Teeth for the purpose of transplanting should never be taken from people with any appearance whatever of disease. Those only should be used which are taken



ken from constitutions in which there is every possible evidence of health ; and with a view to prevent as much as it can be done, every risk of infection being conveyed in this manner, the tooth to be transplanted should be immersed for a few seconds in luke-warm water, and should afterwards be entirely cleared of any blood or matter that may adhere to it, by rubbing it gently between the plies of a piece of soft old linen.

There is reason indeed to imagine, from the result of some experiments made with a view to inoculate the measles, as well as some other diseases, with the blood of those infected with them, that infection cannot be communicated in this manner. But the point is by no means so certain as to warrant our placing much dependence upon it.

## SECTION XI.

*Of the RANULA.*

WE frequently find tumors of different degrees of consistence seated beneath the tongue, sometimes on one side, and at others on both sides, of the frænum; which in general are distinguished by the term Ranula. They are seldom attended with much pain; but they become so large in some instances as to impede the sucking of infants, and the mastication, and even the speech, of adults. In such circumstances, the assistance of surgery becomes necessary in the treatment of them.

In some cases, tumors of this kind contain a fatty kind of matter: This, however is rare; and for the most part, perhaps in nineteen cases of twenty, they are filled almost entirely with a thin limpid liquor very much resembling saliva; and  
we

we find, on cutting into them, that they are often produced by a stoppage of the salivary ducts from calculous concretions forming in them. They sometimes arrive at very considerable degrees of bulk; but in general the tumor bursts when of the size of a large nut, leaving an ulcer which is commonly difficult to heal, if the real cause of the disease be not discovered and removed. I have known an ulcer of this kind treated with much attention for the space of several months—various detergent and even corrosive applications employed for it—nay, in one instance a long mercurial course was administered, but with no advantage whatever; and at last, on the true origin of the disorder being found out, it was cured in the space of a few days, merely by removing a portion of hard calcareous matter, which, by stopping the natural passage of the saliva, first produced the tumor, and afterwards prevented the ulcer, in which it terminated, from healing. In some instances concretions of this kind are very small, not lar-



ger perhaps than the head of a middle sized pin ; whilst in others they are large. I have in different instances found them of the size of a kidney-bean.

In every tumor of this kind that is not of a firm consistence, the most effectual mode of treatment is to lay it open with a scalpel from one end to the other ; by which any calcareous particles contained in it are easily discovered ; and these being removed, the remaining sore commonly heals easily. There is no necessity for washing the sore, as we are generally advised, with tincture of bark and other astringents : On the contrary, warm water and other emollients answer better, by washing out more effectually any particles of stone that may not have been previously discovered. When indeed the sore is afterwards found difficult to heal, the others may sometimes be employed with advantage.

The same kind of management should likewise be pursued in the treatment of old fistulous sores of these parts. In almost  
every

every case of this kind where the disease is seated in any of the salivary glands or ducts, it will be found to be kept up by the cause we have mentioned, a stoppage of the duct by a particle of stone; and the removal of this, by making an incision upon it, and turning it out with a probe or a scoop, will in almost every instance accomplish a cure.<sup>1</sup>

When, again, tumors in this situation are of a fatty or even of a firmer consistence, instead of making an incision into them, they should be extirpated entirely; and unless they lie deep, and are of a large size, this may always be done with safety. Practitioners are very properly indeed afraid of hemorrhagies in this situation; for as the arteries lie deep, it is always difficult, and most frequently impossible, to secure such of them with ligatures as happen to be cut. But any tumor of this kind that is loose, and not deeply attached to the contiguous parts, may be taken out without any risk from subsequent hemorrhagies; for as the superficial arteries

ries of these parts are small, any discharge that occurs from them, in general, stops by the application of spirit of wine—alcohol—or tincture of myrrh.—In more violent hemorrhagies, it would no doubt be proper to employ the potential or even the actual cautery; but these means are seldom necessary.

In removing tumors of this kind by dissection, where they lie so deep that they cannot be easily laid hold of with the fingers, the common small forceps is usually employed; but a small hook with two fangs, such as is represented in Plate L. fig. 3. answers better.

## SECTION XII.

*Of ULCERS of the MOUTH and TONGUE, and extirpation of the TONGUE.*

THE tongue and other parts within the mouth are liable to all the variety of ulcers incident to other parts of the body;



and we need scarcely remark, that the treatment of them should be nearly similar. When they are found to originate from the lues venerea, scrophula, or scurvy, our views should be chiefly directed to the cure of the general disorder of the system; while, on the contrary, when they appear to be entirely local, local applications only should be employed.

Besides other causes of ulcers, however, to which these parts are liable, it is proper to observe, that there is one to which they are more particularly exposed, and which appears to give rise to the greatest part of them, namely ragged teeth. I have known very troublesome sores not only produced, but kept up for a great length of time, on the sides of the tongue, and on the insides of the cheeks, by the sharp points of broken or carious teeth; and as long as the rough part of a tooth, which has once induced a sore of this kind, is allowed to remain, no remedy whatever will heal the sore. In every case therefore of ulcer in the mouth, we should inquire with much  
attention

attention into the state of the contiguous teeth; and when any of them are found to be rough and pointed, they should be made as smooth as possible with one of the small files, Plate LXIII. fig. 5. or 6. Or when the sore appears to be induced by the formation of tartar upon the teeth, it ought to be effectually removed in the manner we have already advised in the eighth section of this chapter.

The removal of the cause is for the most part soon followed by a cure of the sore; but when this fails, we frequently derive some advantage from washing the mouth with gargles composed of decoctions of bark,—a solution of alum,—lime-water,—infusions of red rose leaves—of oak-bark,—and other astringents.

In some cases, however, the sores become worse, notwithstanding the use of these, mercury, and every other remedy. They become ragged and unequal about the edges; they discharge a thin, fetid sanies; and in this state they are commonly attended with much pain.

As long as a sore of this kind remains small, without showing any tendency to spread, there is in general reason to expect a cure; and therefore any violent remedy is considered as unnecessary: But whenever a sore has assumed the appearances we have enumerated, and when it does not yield to any of the means we have mentioned, as there will be little or no cause to doubt of its being of a cancerous nature, the extirpation of it should certainly be advised; and it ought to be done without farther delay.

A cancerous sore, whether it be seated on the tongue, or on the inside of the cheek, if it is only superficial, and does not run deep, may be extirpated with ease and safety; but when the substance either of the cheek or of the tongue is much affected, it becomes an object of more importance, as being attended both with difficulty and hazard. Whatever the risk may be, however, if the diseased parts can be all removed, the operation should certainly be advised; for as we know of no other remedy



medy upon which any dependence can be placed for the cure of cancer, it is surely better to submit even to a considerable risk, than to be left to certain misery.

When a deep-seated cancer in the cheek is to be removed, the easiest and most effectual method of doing it is to make an incision through the whole substance of the cheek, commencing at the contiguous angle of the mouth, and ending at the same part, after surrounding the sore: and the diseased parts being thus entirely removed, the sides of the cut must be laid as neatly as possible together; and a number of gold pins being introduced at proper distances along the whole course of it, a cure will in this manner be completed by the twisted future, in a manner similar to what is employed for the hair-lip, described in Section 1. Chap. XXX. In this manner very extensive cancerous sores may be removed without leaving much deformity; while a very disagreeable unseemly cicatrix is always left after the usual method of doing this operation, by removing

the diseased parts only, and allowing them to heal without being drawn together by futures.

In removing any considerable part of the tongue with the scalpel, as the hemorrhagy which ensues is the only occurrence from whence any danger is to be dreaded, the operator should be previously provided with all the ordinary means of putting a stop to it. When ligatures can be passed round the divided arteries, no other remedy should be trusted; and this, we may remark, may be done more frequently, and at a greater depth in the mouth, than is commonly imagined. As the tongue can be pushed a considerable way out of the mouth, ligatures may be applied for this purpose, even when a good deal of it has been taken away, merely with the common tenaculum or with crooked needles; but when this does not answer, it may sometimes be done in a manner similar to what we have described in Section V. Chap. XXVIII. for the removal of scirrhus tonsils. A ligature being passed round

round the artery with the needle used in fig. 3. Plate LI. it may then be tightly twisted by passing the two ends of it thro' the double canula, fig. 1. Plate XLIV. or a knot may be formed upon it with the instrument, fig. 2. Plate LI.

When, however, it is found to be impracticable to surround the divided arteries either in this or in any other manner, we must endeavour by some other means to put a stop to the hemorrhagy. If the vessels are not large, keeping the mouth filled with astringent gargles, either of alcohol, a strong solution of alum, distilled vinegar, or water strongly impregnated with the vitriolic acid, will often answer: But when these do not succeed, the potential, or even the actual cautery, must be employed as the last resource.

The removal of any considerable part of the tongue we must allow to be a very formidable operation: as such it has been always considered; and accordingly it has been very rarely practised. But, for the reasons mentioned above, I have no hesi-



tation in faying, that it is sometimes necessary, and that it may be done with safety. It ought not, however, to be attempted by every operator; for as it is always attended with a very sudden discharge of blood, the application of means proper for the stoppage of this, and the obviating the effects of fainting, and other unexpected difficulties which sometimes occur, require that steady deliberate coolness which a natural firmness of nerves, conjoined with much experience, alone can give.

### S E C T I O N XIII.

#### *Of the Division of the FRÆNUM LINGUÆ.*

**I**T is sometimes found in children at birth, that the tongue is too closely tied down to the bottom of the mouth, owing to the frænum being either too

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short,

short, or continued too near to the point of it. The method of cure is obvious. This membrane or ligament must be divided so as to allow the tongue to have a free easy motion; and it should be done as soon as it is observed to be necessary, otherwise the sucking of the child may in the first place be impeded, and it may afterwards prove an interruption to speech.

It is proper, however, to observe, that it is not a common occurrence; for although nurses often speak of children being tongue-tacked, who either do not suck readily, or that are backward in speaking, an attentive practitioner will seldom discover it.

The division of this membrane is a very easy operation; but it must be done with attention, otherwise the contiguous blood-vessels will be apt to be injured, by which such a quantity of blood may be lost as might prove hurtful to an infant: It is commonly done either with a scalpel or with common scissors; but it is done both with more ease and safety with the instrument,

strument, fig. 3. Plate LXII. The child being laid across the nurse's knees, the surgeon should open the mouth, and elevate the tongue with the index and middle finger of his left-hand, while with the other he must introduce this instrument, so as to receive the middle of the frænum into the slit, which he may now divide with safety to any necessary depth.

#### SECTION XIV.

##### *Of the Division of the PAROTID DUCT.*

THE parotid gland of each side transmits the liquor which it secretes by a duct of the size of a crow's quill, which, after passing over part of the masseter muscle, penetrates the buccinator in an oblique direction, and empties itself into the mouth about the middle of the cheek.

In the operation which we have just described,



scribed, of extirpating cancerous fores from the cheek, as well as by various accidents, this duct is apt to be cut; and if the two divided ends of it be not retained together till they heal, it often happens that the whole quantity of liquor which it ought to convey to the mouth is poured over the cheek; and the discharge being constantly kept up, the fore is thus prevented from healing, and a fistulous opening left corresponding to the size of the duct. As the fore commonly heals altogether internally, the discharge would necessarily continue during life, if means were not used for preventing it.

In the case of a recent division of this duct, the best practice is to lay the two ends of it as exactly together as possible, and to retain them in this situation till they are united; by adhesive plasters, when this proves sufficient; or by the twisted suture, when the retraction of the divided muscle is considerable: But when this has either been neglected at first, or when it fails of success, as the distant extremity of  
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the duct soon heals, and is entirely obliterated at the divided end of it, owing to none of the fluid secreted by the gland passing through it, the only way in which a cure can be obtained is to make an artificial opening into the mouth, and to endeavour to form an union between it and the upper part of the duct leading from the parotid gland.

In making a passage of this kind, we should carry it as much as possible in the direction of the natural duct; but in order to insure the success of it, it should be rather of a larger diameter than the other. For this purpose a sharp-pointed perforator of a proper size should be entered on the other side of the fore, exactly opposite and contiguous to the under extremity of the superior part of the duct; and being carried with some degree of obliquity, it must in this manner be made to penetrate the mouth. This being done, a piece of a lead probe, exactly the size of the perforator, should be introduced along the course of the newly-formed opening, to be retained

tained in it till the sides of it become callous; when, the lead being withdrawn, the extremity of the duct should be drawn into contact with the superior part of the artificial opening by means of a piece of adhesive plaster, and kept in this situation till a firm union has taken place. After taking out the lead, we have it in our power to expedite the cure, by rendering the end of the duct and of the artificial opening raw with the edge of a lancet or a scalpel, before bringing them together. Till a firm adhesion takes place between them, the patient should be directed to live upon spoon-meat; to speak little or none; and, upon the whole, to make as little exertion with his jaws as possible.

In this manner, fores, which would otherwise continue to discharge saliva for life, may be easily healed, with scarcely any mark being left of their having ever existed. I have had three different instances of it; in all of which complete cures were obtained. A common seton or cord of cotton has been recommended  
for



for this operation instead of lead; and a bit of catgut has been used instead of it: but nothing renders the parts so quickly callous as lead; and besides, it is more cleanly than a cord or tent of any softer substance.

## CHAPTER XXXI.

*Of the DISEASES of the EARS, and Operations practised upon them.*

## SECTION I.

*Of DEAFNESS.*

**D**EAFNESS may proceed from various causes: for as a free passage of sound to the Tympanum or Drum of the ear, together with a sound state of this membrane and of the parts connected with it, are requisite for the sense of hearing;

so whatever tends to obstruct the one, or induce diseases of the other, will necessarily be productive of more or less deafness.

There are two passages for the purpose of conveying sound to the ear; one of them termed the Meatus Externus, terminating in the external ear; and the other the Tuba Eustachiana, ending in the throat. It is true that the first of these is of more importance than the other, for it is larger, and more conveniently placed for collecting sound: but it is certain that the latter or internal passage, is a very necessary part of the organ of hearing; for when by any means it is stopped, deafness to a greater or lesser degree almost constantly ensues. Thus we observe, that any preternatural fulness or enlargement of the amygdalæ, especially when they are attacked with inflammation, is always attended with some degree of deafness. In this way, too, we account for that deafness to which patients are liable who have suffered much from venereal ulcers in the throat; and poly-  
pous



pous excrescences which extend back from the nose and fauces, by compressing the Eustachian tube, are frequently productive of a similar effect.

In that variety of deafness which originates from this cause, a removal of the polypus, or of the swelled amygdalæ, will frequently accomplish a cure, while no other remedy will be of any utility. But when the disease is the consequence either of an ulcerated state of these parts, or of much inflammation, as the extremity of the duct will probably be obliterated, it would be in vain to employ any means whatever. It has indeed been proposed in this variety of obstruction, to endeavour to open the duct, by inserting the end of a curved blunt probe into it, or even to inject a little milk and water, or any other mild fluid, into it with a curved syringe. But although a person well acquainted with the anatomy of the parts, may, by much practice, arrive at such perfection as to be able to do this with little difficulty upon a dead body, there is scarce-

ly any reason to imagine that in practice any advantage will be derived from it: for even in a healthy state of these parts, the irritation produced by the end of a probe or of a syringe must be so considerable as to render every attempt for inserting them very uncertain; and the difficulty must necessarily be greatly increased where the extremity of the duct is obstructed by disease. But if we have not much in our power in the treatment of deafness arising from this cause, we are in many instances able to afford much relief, and even to restore the most perfect hearing where it has been entirely wanting, when the disease proceeds from obstruction in the external passage of the ear.

The meatus externus may be obstructed in various ways. It may be in an imperforated state at birth;—it may be more or less filled with extraneous bodies forced into it;—tumors or excrescences may form in it;—and it may be too much stuffed with wax, the natural secretion of the part. As each of these causes requires a

method of treatment peculiar to itself, we shall consider them under separate heads.

§ 1. *Of an Imperforated Meatus Auditorius.*

AMONG other natural deficiencies to which the human body is liable, none occurs more frequently than an imperforated state of some of the passages. This is not so frequently met with in the Meatus Auditorius as in others, owing perhaps to the lining membrane of this passage being every where attached to bone, by which it is prevented from collapsing. Notwithstanding, however, of this, it has been observed in different instances, and some variety is discovered in the nature of it.

In some cases the obstruction is formed by a thin membrane spread over the mouth of the passage; while in others a considerable part of the conduit is entirely filled with a fleshy kind of substance.

In the treatment of this variety of deafness, nothing, it is evident, can be of any advantage but the removal of the cause by



an operation. When this is determined upon, the patient's head should be secured in a proper light, and at a convenient height, by an assistant; when the operator, with a small sharp-pointed bistoury, should make an incision of a proper length exactly on the spot where the external passage of the ear should terminate. If it is covered by a membrane only, the operation will soon be finished; but when it is impervious to any great depth, the incision must be continued, by making the bistoury in a gradual manner pass further in, either till the resistance is entirely removed, or till there is reason to imagine that the tympanum will be destroyed by carrying it deeper: In which case the instrument should be withdrawn; and in order to prevent the parts newly divided from adhering together, a bit of bougie properly oiled should be introduced, and retained till the cure is completed; care being taken to remove it daily for the purpose of cleaning it, and for wiping off any matter that may have collected in the ear.

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In this manner deafness depending upon this cause may be always removed when the obstruction lies between the tympanum and the farther extremity of the external passage; and it should be always attempted about the time when the child should be beginning to speak. At a more early period the child would not be so able to bear it; and when delayed much later the speech would be impeded; for we know that dumbness depends more frequently on a want of hearing than on any other cause.

§ 2. *Of Extraneous bodies impacted in the Ear.*

ALTHOUGH the viscid nature of the wax of the ears is well calculated for preventing dust and other foreign matters from getting access to them, yet we know that a good deal of uneasiness is in some instances induced by this cause. Children often push small peas, cherry-stones, lead-drops, and other such articles into their

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ears, and flies and other insects frequently creep into them.

When these lie near to the extremity of the passage, flies and other things that can be easily laid hold of should be extracted with small forceps, such as are delineated in Plate LXI. fig. 2. But peas and other round bodies are more easily removed, by turning them out with the end of a curved probe, or with the instrument, Plate XLII. fig. 1. being passed behind them; and their extraction is facilitated by a little oil being previously dropped into the passage.

When insects have got so far into the ear that they cannot be taken out with forceps, the best method of removing them is to wash them out, by throwing in quantities of warm water, or any other mild liquid, with a syringe; but as they adhere while living with considerable firmness to the neighbouring parts, we should first endeavour to kill them, by filling the ear with oil, or any other liquid that proves poisonous to them, without injuring the tympanum. Lime-water, spirit of wine, and



and many other articles, might be employed for this purpose: but nothing proves so harmless as oil; and although it does not kill every species of insect instantaneously, yet few of them will live if immersed in it for any length of time. The patient should therefore be desired to rest his head upon the opposite side; and some warm oil being poured into the affected ear, it may thus be easily kept in it as long as may be necessary.

Peas and other soft bodies which swell with moisture, become often so large when they remain long in the ear, that they cannot but with much difficulty be extracted entire. In this case we should endeavour to break them, either with the points of the small forceps, or with a sharp small hook cautiously introduced along the passage; and as soon as they are sufficiently divided, they must either be taken out piece-meal with the forceps, or washed out with a syringe.

§ 3. *Of Excrescences in the Meatus Auditorius.*

WE have already treated of polypi in the nose and throat; and we may now remark, that the external passage of the ear is equally exposed to them. It is not indeed common for excrescences of this kind in the ear to arrive at such a bulk as they do in the nose; but whoever has attended much to this branch of practice, will acknowledge that they are by no means unfrequent, and they often appear to be the cause of a very obstinate deafness.

On examining the Meatus Auditorius, we sometimes find it entirely filled with a polypous excrecence hanging loose by one pedicle; while on other occasions the passage is obstructed merely by a thickness or fulness of the lining membrane of the ear, when no particular part of it appears to be more affected than another.

As the polypi of this part are usually of a firmer texture than those excrescences which occur in the nose, and as the mem-  
brane

brane of the ear is firm, and does not readily yield, they cannot with propriety be extracted with the forceps ; but they may be taken out either with the knife or by ligature. When they lie near to the external passage of the ear, and can be laid hold of either with small forceps, or with the dissecting hook, Plate L. fig. 3. they may be easily cut out with a probe-pointed bistoury, such as is represented Plate LII. fig. 3. and as they do not appear to be so vascular as similar excrescences in the nose, they may in this manner be removed with perfect safety ; for they seldom discharge much blood. But when they lie deep, it is better to remove them by ligature ; for as the passage is strait, a knife is in this situation introduced with difficulty, and used with uncertainty.

Various methods have been proposed of applying ligatures to excrescences in this situation ; but the method of removing polypi of the nose, described in the explanation of Plate XLVI. appears to be more advisable than any of them. With the  
forked



forked probe, fig. 2. the middle of a ligature may be pushed up at one side of a polypus till it reaches the root of it ; and the two ends of the thread being carried round the excrescence, and inserted into a short double canula, such as is delineated in Plate XLIV. fig. 1. the canula must now be pushed to the root of the polypus on the opposite side ; when the two ends of the ligature being drawn sufficiently tight, and fixed upon the knobs at the end of the tube, the probe may be withdrawn, and the polypus in all probability will drop in a day or two.

But it most frequently happens, that these excrescences cannot be removed in this manner ; for instead of being pendulous by a small neck, they commonly extend a considerable way along the lining membrane of the ear. In this case escharotic applications have been recommended : but as they cannot be employed but with much risk of hurting the tympanum, they should be laid entirely aside ; and this especially as the disease may in general be  
removed

removed by more safe and simple means. This affection of the membrane of the ear I consider to be very similar to that variety of obstruction in the urethra in which bougies prove particularly useful; and the same remedy, when duly persisted in, proves equally serviceable in the one disease as in the other. In the introduction of the bougie, care must be taken not to pass it to the depth of the tympanum, otherwise it may do more harm than good; and the size of it must be enlarged from time to time till the passage is rendered sufficiently open.

When bougies are first passed into the ear, they are apt to create some degree of uneasiness, by irritating the parts to which they are applied; but this soon subsides when they are employed with caution, and properly oiled before being introduced.

§ 4. *Of Deafness from Wax collected in the Ears.*

Whether it be from the lining membrane of the ear being possessed of some degree of a contractile power, or from the  
outward

outward extremity of the passage being somewhat lower than the other, that the cerumen or wax does not usually lodge in it, is perhaps difficult to determine; but it is certain, that in a healthy state of these parts they are for the most part only thinly covered with this secretion: so that it does not appear surprising that deafness should ensue when it is collected in large quantities; for in this state it very effectually obstructs the passage of sound to the tympanum. It commonly happens too, when wax remains long collected in the ear, that it becomes thick, and even hard, insomuch that in some instances it becomes almost as firm as a bit of timber.

The treatment of this variety of deafness is very obvious. By an attentive examination of the ear, we can distinguish with certainty whether there be a superabundance of wax or not: for by placing the ear in a clear sunshine, we can see even to the tympanum; and whenever it is observed that the passage is much obstructed



structed with wax, we should not hesitate in advising it to be removed.

Different methods have been proposed for clearing the ears of wax; but the safest and easiest is by washing or syringing with warm water or any other mild liquid, so as to force out all the stuff that is collected in them. Milk and water, or soap and water, answer the purpose as well as any other article: but before the operation a few drops of oil should be poured into the ear, not with a view to dissolve the wax, for more powerful solvents of this substance might be mentioned; but for the purpose of lubricating the passage, by which it is more easily forced out. By a proper use of the syringe, which a little experience will teach, the ears may be effectually cleared of every obstruction proceeding from wax.

Although obstruction of the external passage of the ear is the most frequent cause of deafness; yet it is proper to know, that in some instances it is produced in a different manner. It may occur from a

morbid state of the tympanum, and of the parts contained within it. To a certain degree it will take place, if either by accident or disease the external parts of the ear be destroyed; and it sometimes occurs from a deficiency of wax.

In scrophulous constitutions the small bones of the ears sometimes become diseased; in consequence of which, a great degree of deafness is produced which is never in any instance removed. In such cases all that art can do, is to preserve the parts clean and free from smell, which is most effectually done by washing out any matter that may collect in the passage, morning and evening, by throwing in a little warm milk and water with a syringe: for if this be not attended to, the matter discharged from the carious bones is apt to become extremely offensive; and it commonly subsists either till the diseased parts of the bones are entirely dissolved and discharged, or perhaps during the life of the patient.

We ought not, however, to confound  
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this disease with a discharge which frequently takes place from the ears, of a much milder nature. In some cases it appears to be the consequence of a boil or abscess in the meatus externus; while in others it occurs without any previous imposthume, and seems to be induced by some slight inflammatory affection of the lining membrane of the ear, or perhaps of the tympanum itself.

This is a very common occurrence, and for the most part I think it is improperly treated. In general it is supposed to originate from morbid humours in the system; so that some risk is supposed to attend any attempt that may be made for stopping it.

This however is an erroneous idea. In most instances it may be traced to the cause I have mentioned, an inflammatory affection of the membrane of the ear; which being of a local nature, no risk it is evident can ensue from checking it. And accordingly I very commonly treat it with injections of a moderately astringent nature,



ture, nearly such as often prove effectual in putting a stop to the discharge of a gonorrhœa. A weak solution of alum, or of saccharum Saturni, frequently answers, or French brandy somewhat diluted. In some cases, putting a few drops of any of these into the ears, morning and evening, will prove sufficient; but when this fails, they may be gently thrown in with a syringe.

It is proper to remark, that the earlier in the disease this practice is employed, the more effectual it usually proves; so that it should never be long delayed. And besides, when the discharge has been of long duration, it is not only apt to do harm, by relaxing, or even destroying the tympanum, but some risk may occur from putting a sudden stop to an evacuation to which the system has been for some time accustomed. The danger, however, may be obviated by the previous introduction of an issue somewhat adequate to the discharge which occurs from the ear, either in the head, neck, or any other part; but  
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in recent cases of this kind there is no necessity for putting the patient to any of the inconveniences with which an issue is sometimes attended; for here the discharge may with safety be stopped immediately.

When deafness occurs either from relaxation of the tympanum, or from any deficiency in the external parts of the ear, some assistance may be derived from our endeavouring to collect or concentrate sound, so as to make a stronger impression on the organ of hearing. Various instruments have been invented for this purpose; but none of them answers so well as one nearly of the form of a common horn, such as is represented in Plate LXIV. fig. 2. Figure 1. is another convoluted tube employed for the same purpose; and fig. 3. represents an instrument intended to be concealed beneath the hair or wig, and to be fixed to the head by the two strings connected with it.

When, again, a deficiency of wax is suspected to be the cause of deafness, dropping a little oil of almonds, or any other

mild oil into the ear, once or twice daily, is sometimes found to prove useful. In some cases too, I have known some advantage derived from inserting a little soft soap into the passage; which not only keeps it moist, but by acting as a stimulus to the lining membrane of the ear, it may thus induce a return of the secretion of wax. With the same view too, I have sometimes employed strained galbanum made into a proper consistence with oil, along with a small proportion of the juice of an onion.

## SECTION II.

### *Of perforating the LOBES of the EARS.*

**B**Y some medical writers of the last and preceding centuries, piercing the lobes of the ears is recommended as an operation that may prove useful in several disorders, particularly in affections of the head. In those times a small seton was drawn through the opening, with a view  
to



to induce a discharge of matter, which in some cases might prove useful. At present this operation is never employed but for the purpose of ornament.

This is perhaps the most simple of all operations; but as it is considered to be of some importance by those on whom it is to be practised, it is necessary to describe it. As heavy ear-rings are apt to tear the parts, the opening should be made as high on the lobe as with propriety it can be done; and the spot should be previously marked with ink. The patient being seated, and the head secured by an assistant, the lobe of the ear should be stretched upon a piece of cork placed beneath it. The surgeon is now to pierce it with the instrument, fig. 6. Plate LXIV. and having pushed it so far through that the tubular part of it is freely out on the opposite side, the cork must be withdrawn with the perforator stuck into it. A small piece of lead-wire is now to be inserted into the tube remaining in the ear; and on being drawn

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into.

into the perforation, the lead must be left in it. By moving it daily, which may be done without giving any pain, if it be previously rubbed with oil, the passage will soon become callous, and thus the operation is completed.

Before concluding the chapter on the diseases and operations upon the ears, it may be expected that we should describe the method of cauterising or burning behind the ears for the toothach. At one period this operation was much employed, and different instruments were proposed for doing it. It is unnecessary, however, to delineate any of them; for the practice is now, we presume, very generally laid aside: and at any rate it may be done with a red hot probe of any kind equally well as with the neatest instrument. It was supposed to prove useful by burning or destroying the nerve producing the pain: but it would rather appear to act by inducing terror or surprise; and if this is the case, it is probable that the same operation

ration would prove effectual if practised in any other part. But as the pain attending it would by most people be considered as more severe even than the pulling of a tooth, it is not probable that it will ever be revived.



## CHAPTER XXXII.

*Of the WRY NECK.*

**T**HE Neck is sometimes considerably bent to one side : When this takes place to such a degree as to be productive of much deformity, the assistance of surgery is in some instances employed for it.

The Wry Neck may be produced in various ways. It may depend upon an original mal-conformation of the bones of the neck—Upon a preternatural degree of contraction in the muscles of one side of the neck, particularly of the sterno-mastoideus muscle—Or, it may be induced merely by a contraction of the skin, in consequence of extensive sores and burns.

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When the vertebræ of the neck are found to be distorted, it would be in vain to attempt any means of relief; but either of the other causes we have mentioned seem to admit of almost a certain removal.

In books of surgery the operation for the wry neck is very commonly described; and as this deformity has in general been imagined to proceed solely from a contraction of the sterno-mastoid muscle, a division of this muscle is usually recommended as the only method of cure that can be depended on. Even Mr Sharpe was of this opinion; and he delineates an instrument termed a Probe-razor for performing it\*.

But were we even to admit that the division of this muscle was a necessary measure, the method of doing it by introducing the probe-razor beneath it and dividing it afterwards, as is recommended, appears to be exceptionable, as being attended with much risk of wounding the

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\* Vide Sharpe's Surgery, Chap. XXXV.

contiguous blood-vessels : It would surely be better to divide the muscle by repeated strokes of a scalpel, and to continue the incision in a gradual manner to such a depth as may be necessary; by which even the large veins of the neck would be avoided. But although we allow that a wry neck may be sometimes produced by a contraction of this muscle, yet it appears to be a very rare occurrence : I have met with different instances of this deformity, and in all of them the contraction seemed to be in the skin alone.

When the skin only is affected, the parts are more easily separated and with less risk than when any of the deep-seated muscles are to be divided : but even this should be slowly done, so as to avoid the external jugular veins; for although no great detriment might ensue from their being cut, we should run no risk of wounding them unnecessarily. But whether the cause of contraction be seated in the sterno-mastoid muscles or in the skin, the incision should be carried so deep as to remove it effectually,



tually, otherwise little or no advantage will be gained by the operation.

We ought not, however, to conclude, that our object is accomplished by the mere division of the contracted parts; for unless some method be employed to support the head during the cure of the sore, it will still be apt to incline more to this side than to the other, by which the parts newly divided will readily unite again, so that no advantage will be gained by the operation. By Mr Sharpe and others we are indeed advised to stuff the sore with lint, so as to prevent this inconvenience with as much certainty as possible; but I know from experience that this does not succeed, and that nothing will answer but a firm support being given to the head. For this purpose the instrument represented in Plate LXVI. fig. 1. will be found very useful: It was made for a case of this kind, in which it was used for several weeks, and with complete success. It should always be wore not only till the sore is entirely heal, but for some time there-

thereafter; and if it be properly fitted to the parts upon which it is to rest, it is used without producing any uneasiness.

The skin beneath the chin is sometimes so much contracted in consequence of burns and other causes, as to draw the head considerably down upon the breast: The same method of cure must be practised for it that we have just recommended for the wry neck. The contracted skin must be freely divided with a scalpel, and the head must be properly supported from behind till the sore is completely cured.

## CHAPTER XXXIII.

*Of DISEASES of the NIPPLES.*

**T**HE Nipples are in some cases so deeply sunk in the breast, that a child in attempting to suck, finds it difficult or even impossible to lay hold of them.

To remedy this inconvenience, different means are employed. If the prominent part of the breast can be pressed so far back as to uncover even a small part only of the nipple, it may commonly be drawn out by laying a stout child of six or eight months old to suck it: But as this cannot  
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be always done, glasses of different kinds are employed for the same purpose. In Plate LXV. figs. 1. and 3. represent two forms of glasses with which the breast may either be sucked by the patient herself or by an assistant; and fig. 2. is a glass cup mounted with a bag of elastic gum. In using this the air must be pressed entirely out of the bag, when the cup being placed upon the breast so as to include the nipple, such a degree of suction is produced as has a considerable effect in drawing it out. The bag, however, should be much larger than it is commonly made; for when of the ordinary size, it does not act with sufficient force. But whichever of these means is employed, it ought to be persisted in till the nipple is drawn fully out; and this should be always done immediately before the child attempts to suck.

The nipples, like every other part of the body, are liable to ulcerations; but from their peculiar delicacy, any sores with which they are attacked, are always productive

ductive of much distress, while the sucking of the child tends not only to render them worse, but of much longer duration than they otherwise would be. Cracks or chops in the nipples have not a formidable appearance, but they are commonly much more painful than ulcers of the greatest extent.

Various remedies are employed for affections of this kind, but emollients are most frequently used: I have not found, however, that applications of this kind ever afford any permanent relief; for although they may give temporary ease, this seldom if ever proves of long duration. Mild astringents and drying applications are more to be depended on. As a wash, lime-water proves often useful; and Port-wine and water, or brandy sufficiently diluted, may likewise be employed for the same purpose. After bathing the parts with one or other of these, the nipple should be covered with a bit of soft lint spread with Unguentum Nutritum or Goulard's Cerate; but of these the  
first

first is by much the best: I have often used it with much advantage, and I know of nothing that answers so well in chops or cracks wherever they are situated. I find too, that it is much employed by my friend Doctor Hamilton Professor of Midwifery in this University; whose practice being very extensive, his authority may be relied on. It is proper, however, to observe, that the nipple should be entirely cleared of this application always before the child is allowed to suck; for as lead forms the basis of it, mischief might ensue from much of it being carried into the stomach.

Till the nipple is completely healed, the child should not be allowed to suck often-er than is altogether necessary; and when one of the nipples only is sore, this may be always managed with little difficulty, as the child may be kept at the sound breast while the other may be drawn from time to time with a glass, which does not injure the nipple. In Plate LXVI. figures 2. 3. and 4. some small cups  
are



are represented for protecting the nipples during the cure. When properly fitted to the parts, they not only protect them from the friction of the cloaths, but they allow the milk to run off as quickly as it falls from the breast.

CHAP.

## CHAPTER XXXIV.

*Of ISSUES.*

**I**SSUES are small artificial ulcers which we form in different parts of the body, for the purpose of procuring a discharge of purulent matter.

As I have elsewhere treated fully of the advantages that may be derived from issues, and of the manner in which they seem to act in the cure of diseases, it is not at present necessary to enter minutely upon this part of the subject: I shall therefore only observe in general, that I am daily more and more convinced of the utility of issues in the cure of long continued

nued fores, of whatever kind they may be; and that I am still of the opinion that they act solely by discharging a certain quantity of the ferous parts of the blood; and not that they serve merely as drains for the noxious humours in the blood, which till of late has been the prevailing idea upon this point \*.

Among other errors in practice which this opinion gave rise to, the choice of situation for issues was none of the least remarkable. As it was imagined that ulcers as well as other local affections were produced by a determination of morbid humour to a particular spot, when issues were advised, it was considered as necessary to place them as contiguous to the affected part as possible, and always on the superior part of the limb when the disease was seated on any of the extremities, in order to prevent the morbid matter from falling down to it. But as we now con-

VOL. IV.

B b

clude

\* See a Treatise on the Theory and Management of Ulcers, Part II. Section I. where this subject is more fully considered.



clude that issues prove useful or otherwise merely by the quantity of matter which they afford, it appears to be of little importance where they are placed ; and accordingly they may be inserted wherever the patient thinks they will occasion the least inconvenience.

There are some general rules, however, which should be always attended to in the introduction of issues : They should never be placed immediately above a bone thinly covered—nor directly above a tendon—nor very contiguous to a large blood-vessel or nerve—nor upon the belly of a muscle. The best situation for issues is that space which lies between the tendons on the back-part of the neck, where there is a considerable depth of cellular substance—the middle of the humerus, near to the insertion of the deltoid muscle—and a considerable hollow above the flexor tendon on the inside of each knee. They may likewise be inserted between two of the ribs, and on each side of the vertebræ of the back ; or in short wherever there is a sufficient

ficient quantity of cellular substance for the protection of the parts beneath. It is proper, however, to remark, that the spot usually fixed upon for issues is perhaps the most improper of any, I mean directly below the knee; where there is never much cellular substance; where the veins of the leg can scarcely be avoided; and where the contiguous tendons are apt to be hurt by them.

There are various ways of forming issues: By corroding or removing the skin with epispastic applications;—by making an incision with a scalpel or lancet;—by the application of caustic;—and by the introduction of a cord.

When an issue is to be opened by removing a portion of skin, a blister must be applied upon the spot exactly of the size of the intended sore; and on the blister being removed, a discharge of matter may be kept up, by dressing the part daily with any of the common ointments in which there is mixed a small proportion of cantharides in fine powder: Or, it some-

times proves sufficient to use an irritating application of this kind, and a mild ointment of wax and oil alternately.

In forming an issue by an incision, or with caustic, an opening must be made of such a size as appears to be sufficient for affording a proper quantity of matter; and the opening must be preserved by inserting daily into it some extraneous body covered with any mild digestive ointment, such as basilicon or linimentum Arcæi, while the whole must be secured with a proper bandage. Peas are commonly employed for this purpose. Kidney-beans answer very well; and some make use of gentian root, and of aurantia Curaflavenfia, usually termed Orange Peas, turned into a proper form. When the opening is made by an incision, the skin should be supported on one side by an assistant, and on the other by the left-hand of the surgeon; who should now with a scalpel in the other make a cut of a sufficient length and depth for receiving the number of peas intended to be put into it, and thus the operation is finished:

But



But when it is to be done with caustic, more attention is requisite. The common lapis infernalis of different Dispensatories answers best : many compositions of caustic paste have been recommended ; but I have met with none that for this purpose answers so well. It should be first reduced to powder, and made into a paste with a little water, or with soft soap, when as much of it should be applied upon the spot where the issue is wanted as will make an opening of a proper size ; but as it is apt to spread to the contiguous parts, some care is required to prevent it. For this purpose a piece of leather spread with Burgundy pitch or any adhesive plaster, with a small hole cut in the centre of it, should be placed upon the part with the opening directly above where the caustic is meant to be applied. The small spot which is thus left uncovered, must now be spread with some of the caustic paste ; and over the whole there should be laid another piece of leather spread with the same kind of adhesive plaster, so that there may be no chance of

any part of the caustic escaping. In the course of ten or twelve hours, the whole may be removed; for before this, if the caustic is good, it will have produced an eschar of a sufficient depth. In the space of three or four days, the eschar will separate from the contiguous sound parts, when the opening formed by it must be filled with one or other of the substances we have mentioned.

When it is an object to discharge a large quantity of matter by an issue, and especially when we wish to have it from deep-seated parts, we do it by the introduction of a cord of cotton or silk, forming what is commonly termed a Seton. This remedy is often used with advantage in deep-seated pains, particularly in pains of the breasts and sides in cases of phthisis pulmonalis. In such cases it is commonly inserted between two of the ribs; and it answers better in the direction of the ribs than when placed across them, as is sometimes done. A cord is a frequent remedy too in affections of the head, particularly  
in

in ophthalmia and other diseases of the eyes ; and in such cases it is usually placed in the back of the neck.

When we mean to introduce a cord, the parts at which it is to enter and pass out should be previously marked with ink ; and the cotton or silk being put into the eye of the flat needle, Plate LXVI. fig. 5. and the parts being supported by an assistant, the needle should now be pushed in at one of the spots and carried out at the other, along with two or three inches of the cord, which should be left hanging out. The irritation which the cord excites soon produces a plentiful discharge of matter, which may be increased or diminished at pleasure by covering the cord daily, before it is drawn, with a mild or an irritating ointment.

In former times, it was a frequent practice to form issues by burning the parts in which they were to be introduced with the actual cautery ; and in some parts of Europe it is still continued : But as it is much more terrifying than any of those



we have mentioned, and as it does not appear to be attended with any particular advantage, it is now in general laid aside.

In China, Japan, and some other eastern countries, it is a prevailing practice, we are told, in deep-seated pains, to burn the parts affected down to the bone with moxa. Moxa is a light, soft down, of a particular plant. A small cone of it being wrapped up, the base of the cone is fixed upon the part with a little glue or mucilage; and fire being put to the opposite end of it, it is allowed to remain till the whole is consumed; and if one application does not prove sufficient, it is repeated once and again as long as it is necessary. The operation may be done equally well with fine flax; but altho' it has been sometimes done in different parts of Europe, it is not probable that it will ever be generally practised. I have known it, however, remove the most obstinate sciatic pains, where every other remedy had failed.

## CHAPTER XXXV.

*Of the Inoculation of the SMALL-POX.*

**T**HERE is ground to imagine, that almost all eruptive diseases, as well as some others, may be communicated by inoculation: the practice, however, is confined to such as are not apt to return; for no advantage would arise from inducing diseases to which the system might afterwards be liable. The plague has been communicated by inoculation; but in this country the small-pox is the only disease we are accustomed to inoculate. Some trials have indeed been made for inoculating

ting the measles; but as yet they have not succeeded.

From the result of some experiments, there is reason to think, that no disease can be communicated by inoculating with the blood of an infected person. This point, however, is not as yet precisely determined; so that farther trials will be necessary to ascertain it. In inoculating the small-pox, we employ the matter contained in the pustules which appear on the surface of the body.

The proper period for inoculating—the preparation of the patient—and the subsequent treatment of the disease, are points which more particularly fall to the consideration of the physician. The mode of communicating the infection is our object at present.

In the more early practice of inoculation, it was customary to tie an infected thread round the arm or leg; to rub a little variolous matter upon any part of the body; or to insert a piece of thread soaked in matter beneath the cuticle, with



a small needle, and to allow it to remain till there was reason to think the infection had taken place. In any of these ways, the small-pox may be readily communicated: but as by some of these means there is reason to suspect that a variolous atmosphere may be produced, and that the disease may thus be induced in the same way as in the case of common contagion, and consequently that some of the advantages of inoculation may not be obtained, these modes of giving the small-pox have therefore been long laid aside.

Till of late inoculation was commonly performed by making an incision of about half an inch in length through the skin to the depth of the cellular substance; a bit of thread impregnated with variolous matter was then inserted, and retained for two or three days by means of a compress and bandage. To this practice, however, the great unnecessary pain attending it, and the aptness of the wound to degenerate into a disagreeable ulcer, are strong objections.

The

The present mode of inserting the matter appears to be in every respect more eligible. The point of a lancet, previously covered with variolous matter, is insinuated through the cuticle, so as to scratch or slightly injure the cutis vera. It might frequently indeed be sufficient to pass it through the cuticle only; but success is more certain when a small particle of blood follows the lancet. When the matter is recently taken in an early period of the disease, the lancet may be introduced without being moistened: But whenever the matter has become firm and hard, it should be rendered perfectly soft with a drop of warm water, or by holding it in warm steam.

The operation may be done in any part of the body; but the arm is generally preferred. One scratch would for the most part prove sufficient; but with a view to ensure success, it is right to make two or even three at the distance of an inch from each other. It is to be observed, however, that when the matter takes effect in  
all

all the scratches, the inflammation that is induced being communicated from one to the other, is often considerable, and gives much pain and uneasiness. This might be prevented by making the scratches at a still greater distance, or even in distinct parts of the body. One being made upon each leg or thigh would obviate every inconvenience of this kind.

In this method of inoculating we never employ either bandage or compress; for the wound is so trifling that no kind of dressing is necessary: so that we readily see, at the end of the second or third day, whether or not the infection will take place; for in general, by this time, when the operation is to succeed, the scratches made with the lancet become red, swelled, and somewhat painful.

EXPLA-



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## EXPLANATION OF THE PLATES.

### PLATE XXXIX.

[Opposite to page 21.]

Fig. 1. The knife which Mr Pellier commonly employs in the operation of extracting the cataract. It should be highly polished, and so very sharp as to penetrate the eye with ease; at the same time that it should be of a sufficient strength for dividing the cornea without yielding. This, as well as the other two knives in this plate, are made to fit the handle of the knife represented in Plate XLI. fig. 2.

Fig. 2. A knife exactly of the same form  
and

PLATE XXXIX.







and size with the other; only in this, that side which passes next the iris is round or convex, with a view to protect that membrane from being injured, which it is apt to be when the common flat knife is employed in eyes that are not prominent.

Fig. 3. A probe-pointed knife, which in some cases may be employed with advantage for finishing the operation, when by any accident the aqueous humour escapes before the point of the other knife has pierced the opposite side of the cornea: But for a more particular account of the method of using it, we must refer to page 27.

Fig. 4. A pair of curved scissars of a proper size for every operation on the eyes where scissars are needed: Indeed every operator who practises much in this branch should be provided with them.

Fig. 5. This is the only speculum which Mr Pellier employs. It may be made of gold or silver wire, or of any other metal. It is here represented of the full size,  
both

both in length and in thickness of wire. In using it, either the curve at *A* or *B*, is placed upon the upper eye-lid directly behind the cartilaginous boarder; and being given to an assistant, a degree of force must be applied with it sufficient for fixing the eye; which is easily done, if the operator at the same time makes some resistance by placing the index and middle fingers of one hand on the under edge of the orbit so as to compress the eye beneath.

All the instruments of this Plate are represented of the full size.

## PLATE XL.

[Opposite to page 39.]

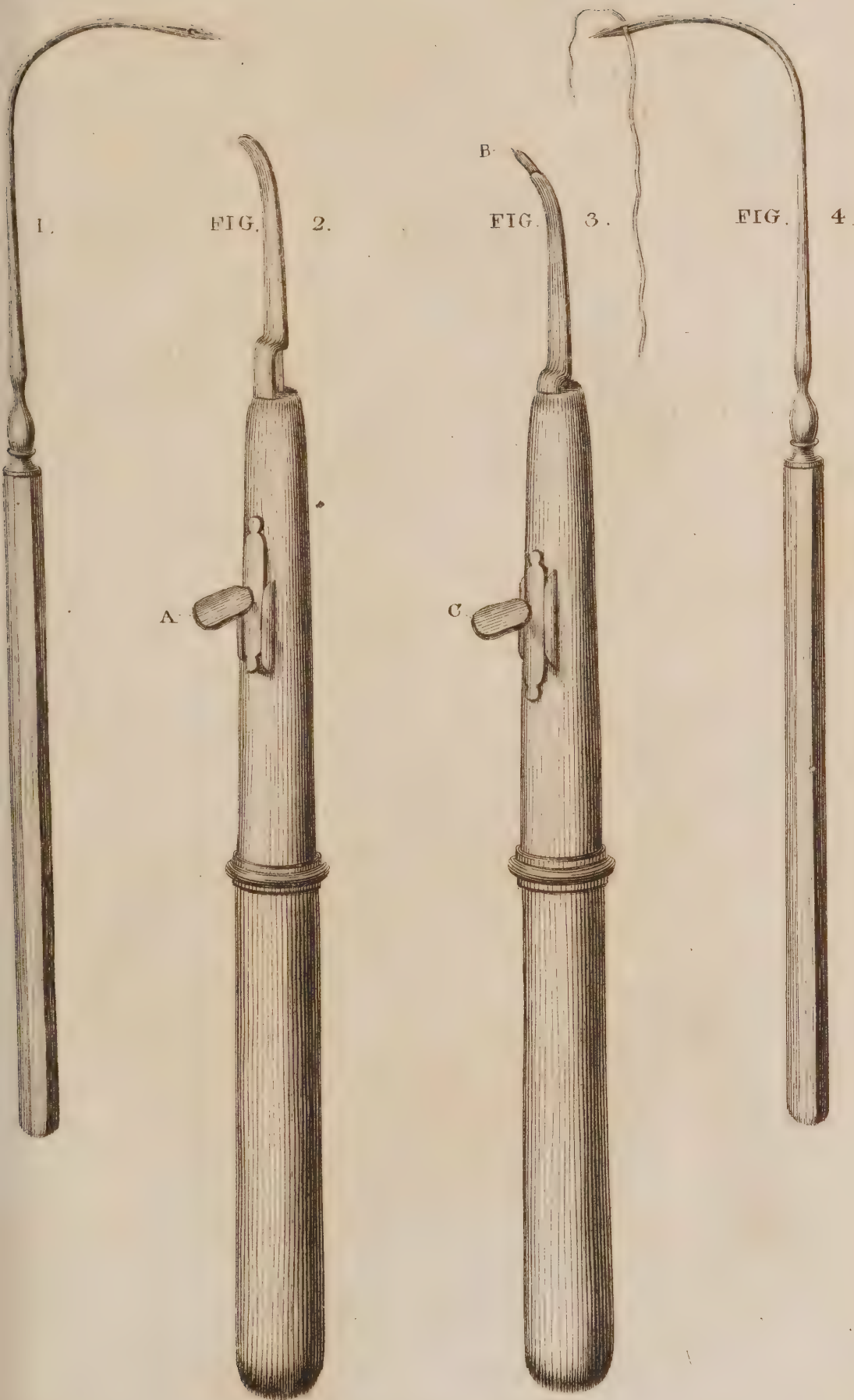
Fig. 1. A curved needle fixed in a handle for the purpose of passing ligatures beneath the pterigium and other small excrescences, which now and then occur within the orbit, and even upon the eye itself. I have elsewhere shown that they may be removed without this precaution\*;

2

but

\* Vide Chapter XXVII. Section VIII. Vol. III.

PLATE . XL.



DLZar's Sculp<sup>t</sup>





PLATE XIV.

FIG. I.

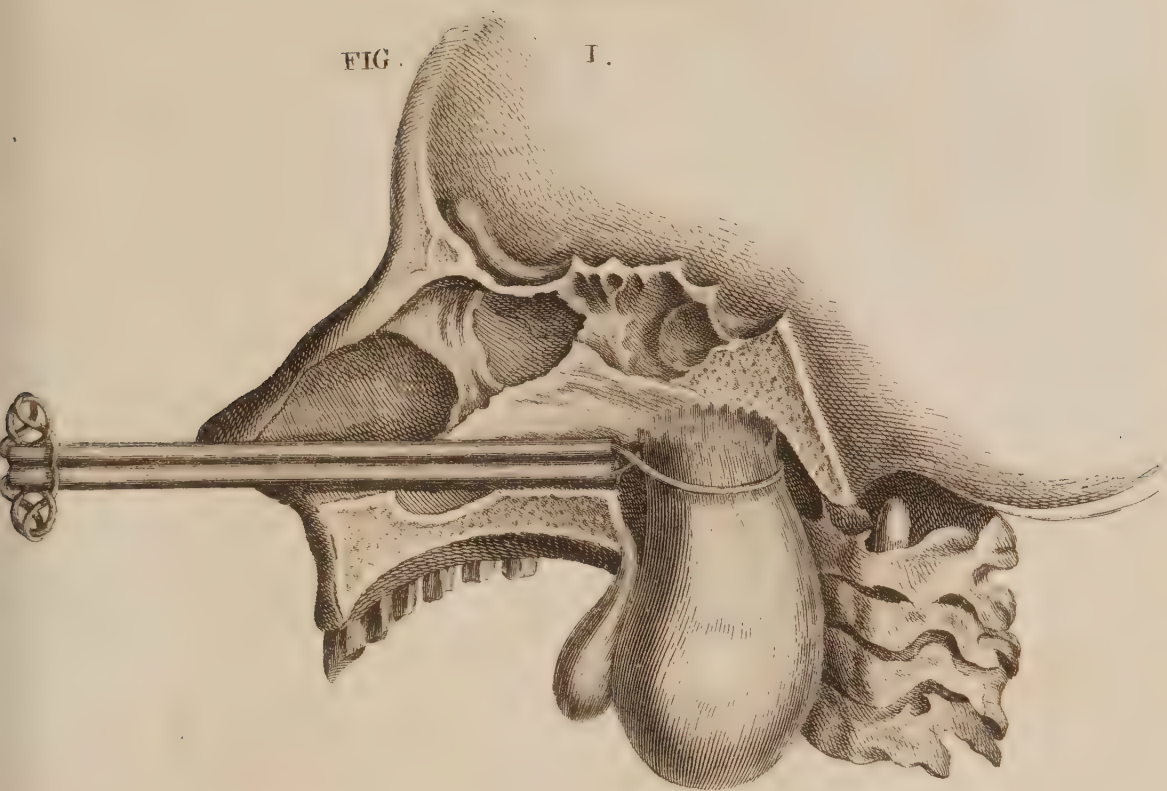
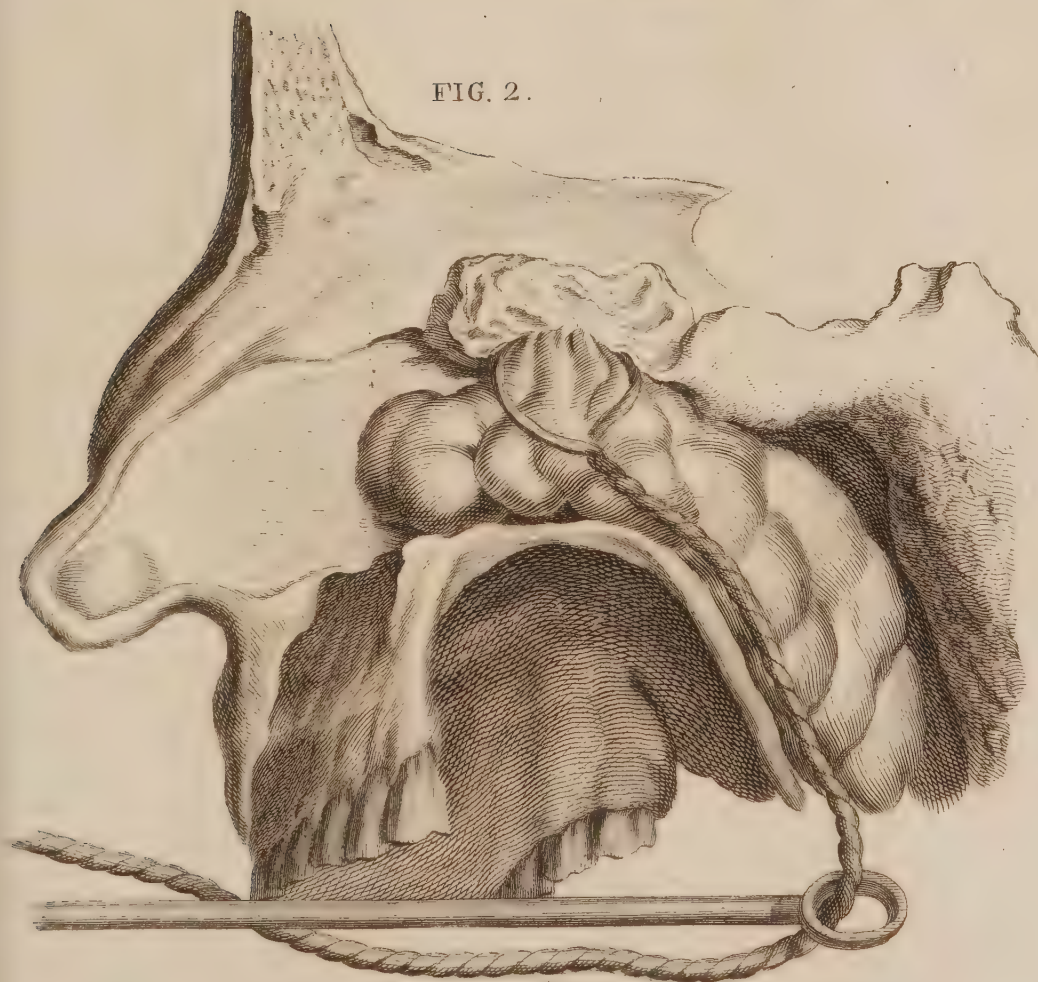


FIG. 2.







but as Mr Pellier is accustomed to employ a ligature, I think it right to describe his method of inserting it. Fig. 1. is intended for tumors on the right eye, and to be used with the left-hand of the surgeon. Fig. 4. is for the left eye, and to be used with the right-hand.

Figs. 2. and 3. An instrument which Mr Pellier names a Cistatome, from his using it in particular cases for opening the capsule of the crystalline lens. It may be made of gold or any other metal. In using it, he holds it between the thumb and two fore-fingers of his right hand; taking care to place the thumb upon the button A or C, which is connected with a sheath that covers the sharp point B. The hand being supported upon the cheek by the ring-finger and little-finger, the point of the instrument covered with the sheath must be cautiously passed through the pupil till it reaches the lens; when the button C being drawn back with the thumb, the point of the instrument will thus be set at liberty without the hand being

moved. This is an ingenious invention, and answers the purpose with ease and safety.

These instruments are all represented of the full size.

### PLATE XLI.

[Opposite to page 50.]

Fig. 1. An instrument for depressing the under eye-lid. When an assistant cannot be procured, it may often prove useful. The two flat hooks at the upper end of it being fixed upon the cartilaginous edge of the eye-lid, the other end of it hanging over the cheek, by its weight draws it considerably down.

Fig. 2. A knife which Mr Pellier employs in some cases for the operation of extracting the cataract. It is fixed in the handle at *B* by a male-screw fitted to a female-screw, which is turned by the nut *A*. This handle may be made to answer figures 4. and 5. as well as every knife employed in operations on the eyes.

Fig.

Fig. 3. An instrument for determining the quantity of skin to be removed in the operation for the Irichiasis or Inversion of the Eye-lids. When it is found necessary to remove a portion of skin from beneath the under eye-lid, or from the superior part of the upper palpebra, it may be done with a common scalpel, while an assistant supports or elevates it from the parts beneath either with his fingers alone or with forceps made for the purpose; but this instrument answers better, as by means of it the parts which ought to be removed can be cut off with more precision.

Fig. 4. A knife for opening small collections of matter on any part of the eyeball. Being blunt on the back and round on the end, it is used without any risk of injuring the contiguous parts.

Fig. 5. A sharp-pointed curved knife, which answers very well for dividing the vessels of the eye or of the palpebræ, whenever this operation is judged proper.

These instruments are all delineated of the full size.



## PLATE XLII.

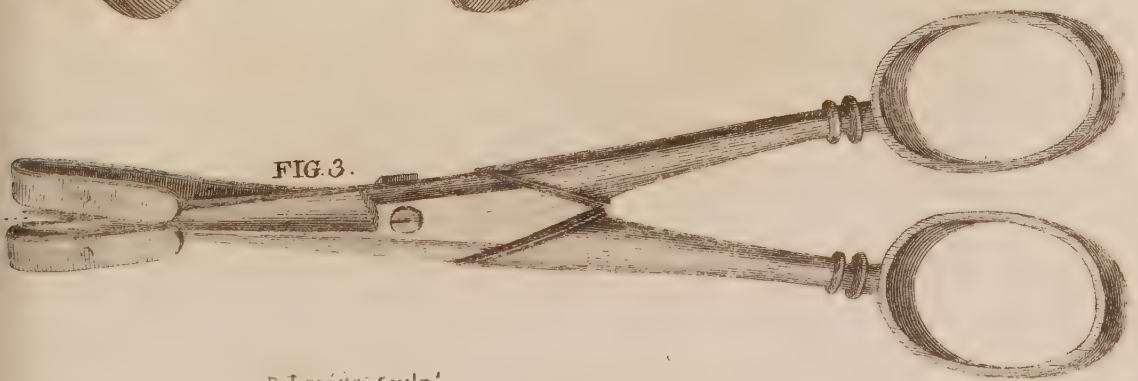
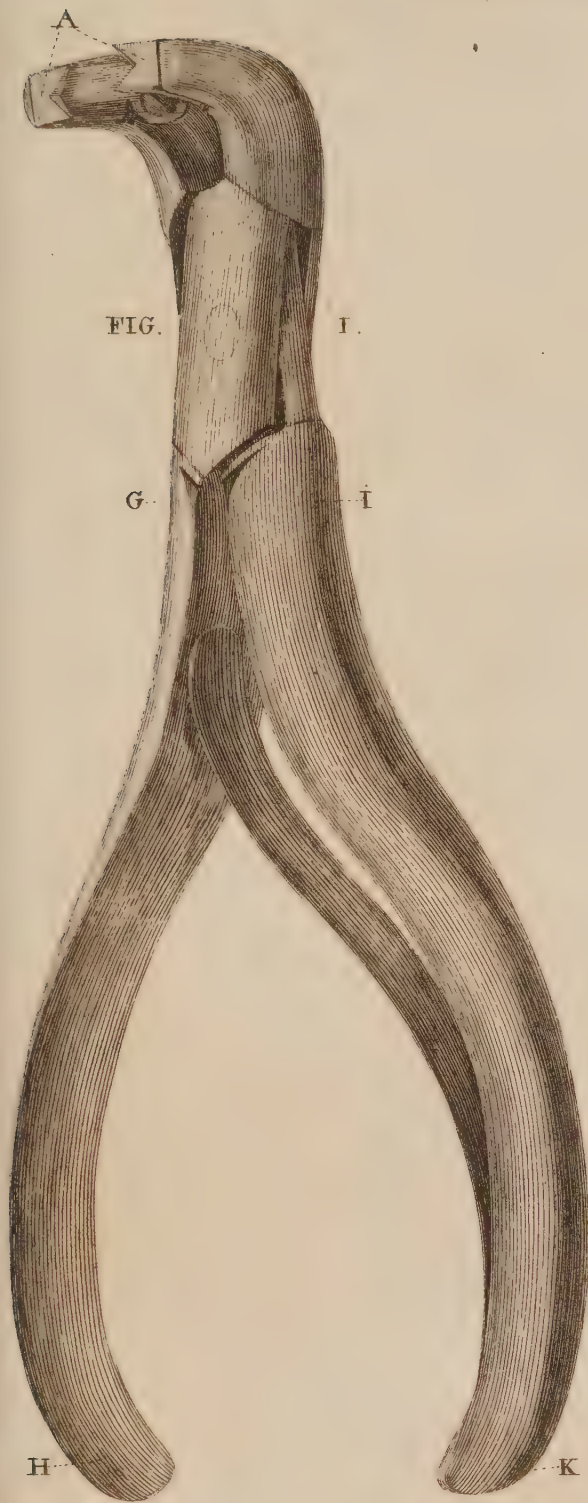
[Opposite to page 57.]

Fig. 1. A small scoop, which answers better than any other instrument for removing small stones, peas, or any other substances from the nostrils or ears.

Figs. 2. 3. 4. 5. and 6. Are instruments employed by Mr Pellier for the operation of the Fistula Lachrymalis. Fig. 2. is a perforator and conductor for clearing the passage through the os unguis into the nose. Figs. 5. and 6. are tubes for leaving in the passage. Fig. 3. is a compressor for fixing them after they are inserted; and the easiest method of inserting a tube is by putting it upon the conductor after it is passed through the compressor, as is represented in fig. 4. The conductor armed with the tube and the compressor being passed through the passage into the nose, must be withdrawn; when, by means of the compressor, the tube may be firmly fixed.

These instruments are all represented of the full size.

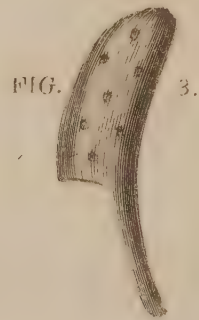
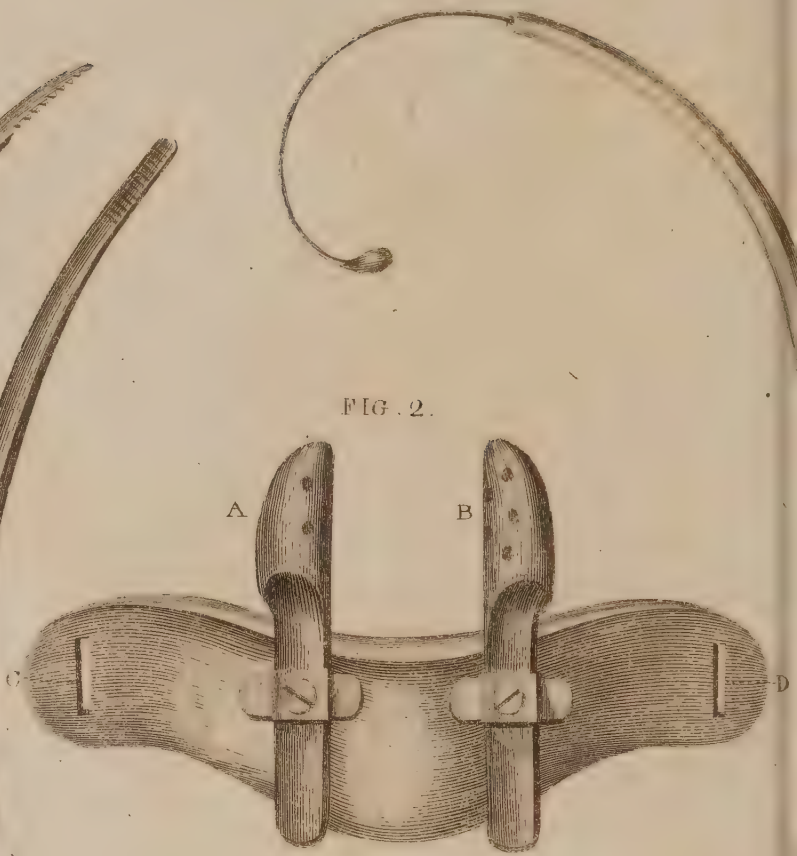
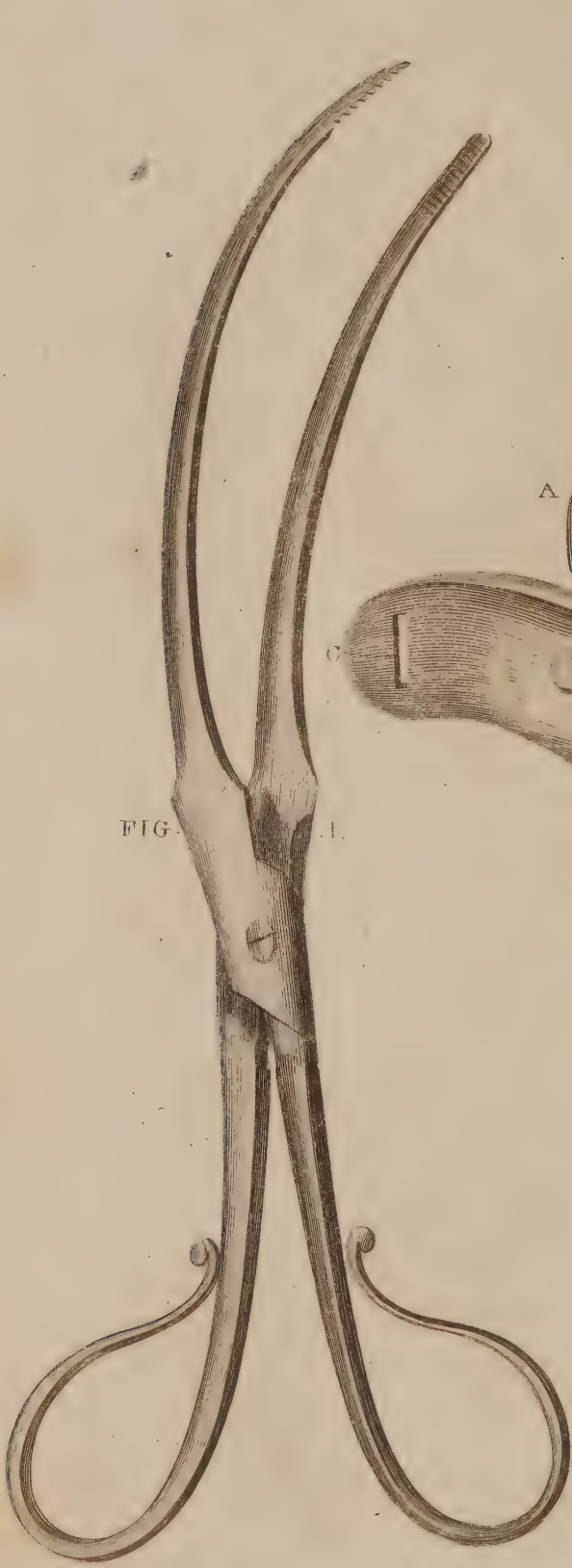
PLATE















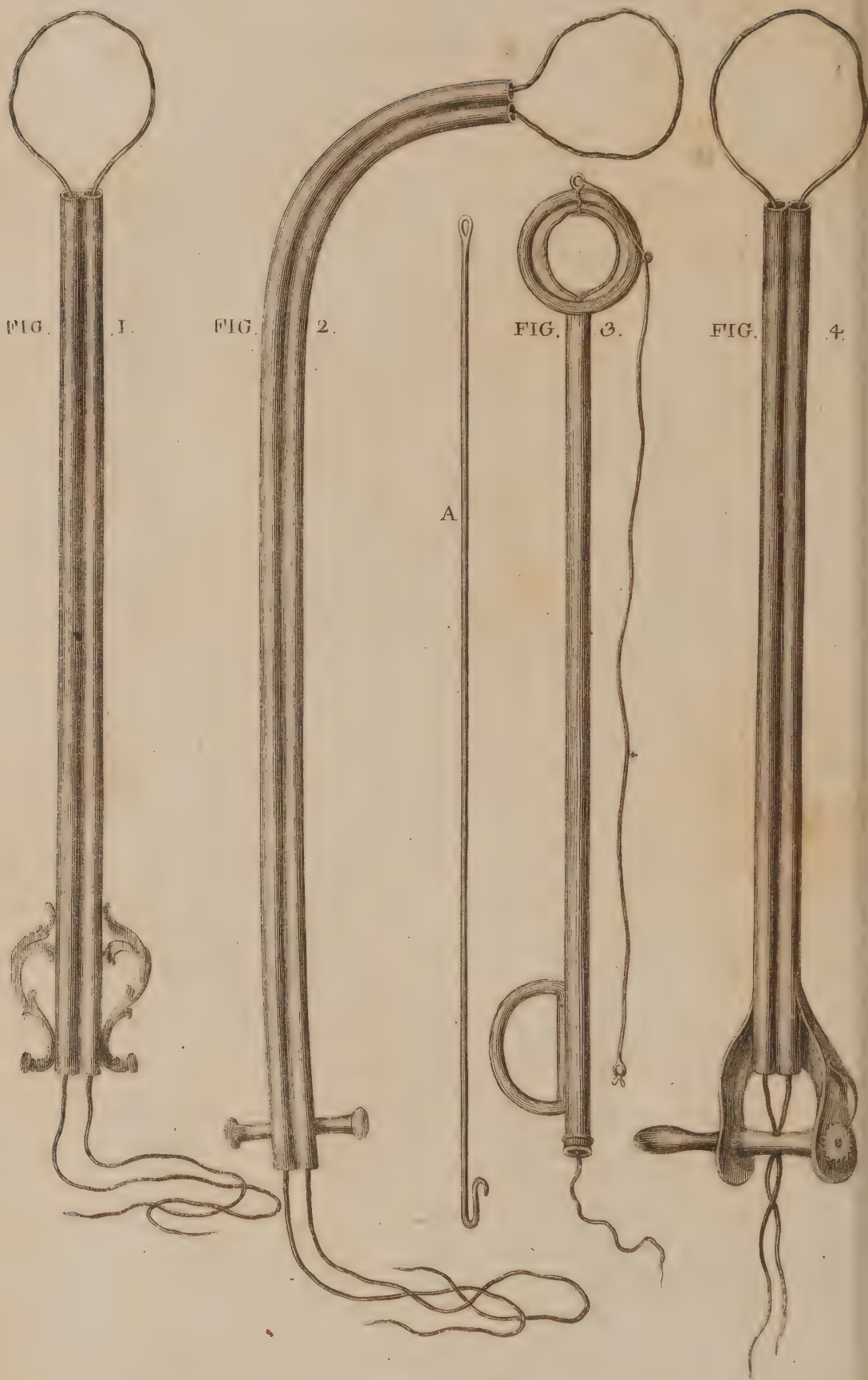


PLATE XLIII.

[Opposite to page 74.]

Fig. 1. Forceps of a convenient form for extracting small bones or other substances from the throat.

Fig. 2. An instrument for preventing the nostrils from collapsing after the operation described page 85. *A B*, Two moveable tubes for inserting into the nostrils, to be retained in their situation by a ribbon passed through the openings *C D*, being tied on the back-part of the head.

Fig. 3. A side-view of one of the tubes.

These instruments are all represented of the full size.

PLATE XLIV.

[Opposite to page 109.]

Fig. 1. A double canula for the purpose of fixing ligatures upon polypous excrescences either in the nose, throat, ears, or vagina. The ligature passed through it may either be of catgut or pliable silver-wire.

Fig. 4. Is a canula for the same purpose, but of a different construction. When the other is used, the ligature is tied round the handles of the instrument. In this the ligature passes through a moveable handle, and is easily turned to any degree of tightness.

Fig. 2. Is a canula of the same kind with the others; but being crooked, it is better calculated for removing polypi that are deeply seated in the throat. The method of using these instruments is described in different parts of Section V. Chapter XXVII.

Fig. 3. Is an instrument for passing a ligature over the uvula. A thread being passed through the tubular part of the handle with the probe *A*, a noose must be formed upon it; and being lodged in the groove on the inside of the ring, the other end of the thread must be passed through the two small holes on the outside of the ring; and thus it is ready for use. It is commonly termed Hildanus's Ring, from the name of its inventor. All  
these



these instruments are represented of the full size.

### PLATE XLV.

[Opposite to page 117.]

Fig. 1. A section of the bones of the head, representing a polypus in the throat hanging down behind the velum pendulum palati, with a ligature passed over it and fixed at the root of it, with a double canula inserted through one of the nostrils.

Fig. 2. This figure is taken from Mr Cheselden. It represents a polypus in the nose, with part of it passing back into the throat, and the rest into the nostril, with a ligature inserted from the nostril into the throat, in such a manner as to include the root of the excrescence in its doubling. By afterwards twisting the ends of it, a degree of compression may be applied upon the root of the polypus sufficient for removing it; but it would not answer in every case; and as the method with the canula is not only more easy but more ef-

fectual, the other will now probably be laid aside.

### PLATE XLVI.

[Opposite to page 120.]

Fig. 1. A polypus of such a size that it distended the nostril completely. It was removed with a ligature as is here represented. *A*, The extremity of the polypus which appeared without the nostril. *C*, A probe of silver or any other metal, split at the end, in such a manner as to retain a piece of catgut or silver-wire; the doubling of which being inserted into it, should be pushed up to the root of the polypus on one side, while the tube *B* being passed upon the two ends of it, must be pushed up to the root of it on the opposite side, when the ligature may be easily drawn to any necessary degree of tightness.

Fig. 3. A slit-curved probe, which may be used for the same purpose, viz. for applying a ligature to the root of a polypus in tumors seated in the throat. By this simple invention a ligature may be carried  
to

PLATE XLVI.

FIG. 1.

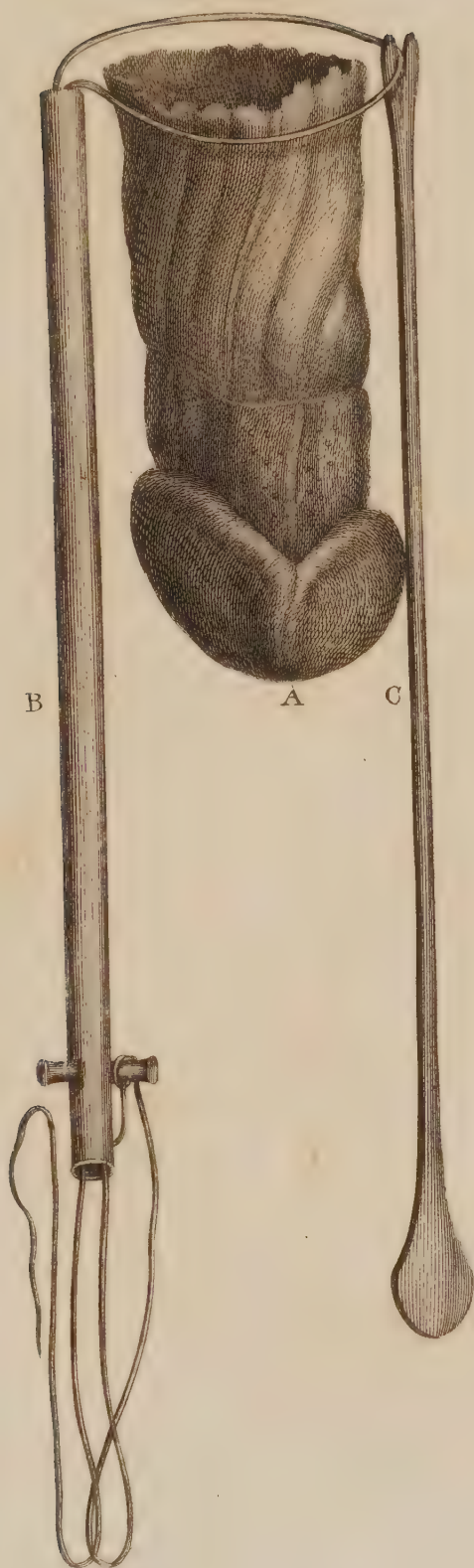
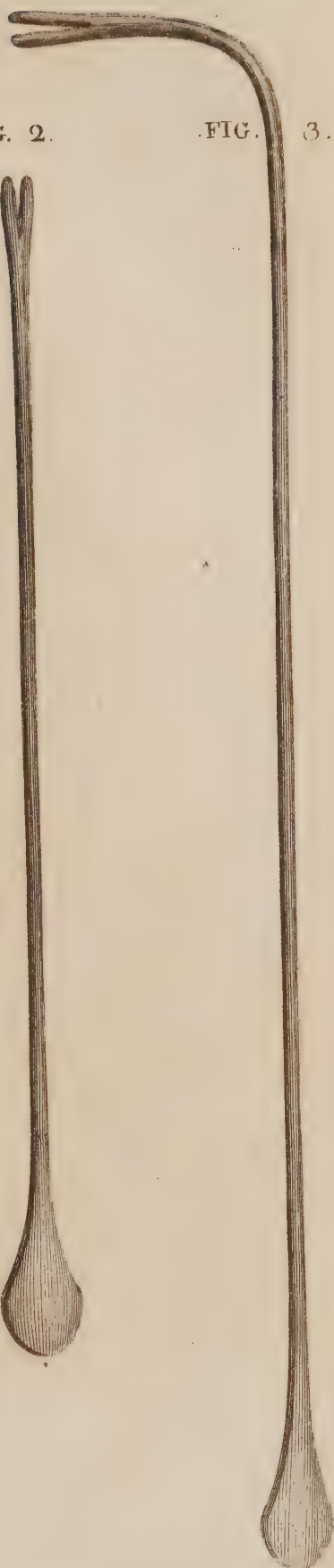


FIG. 2.

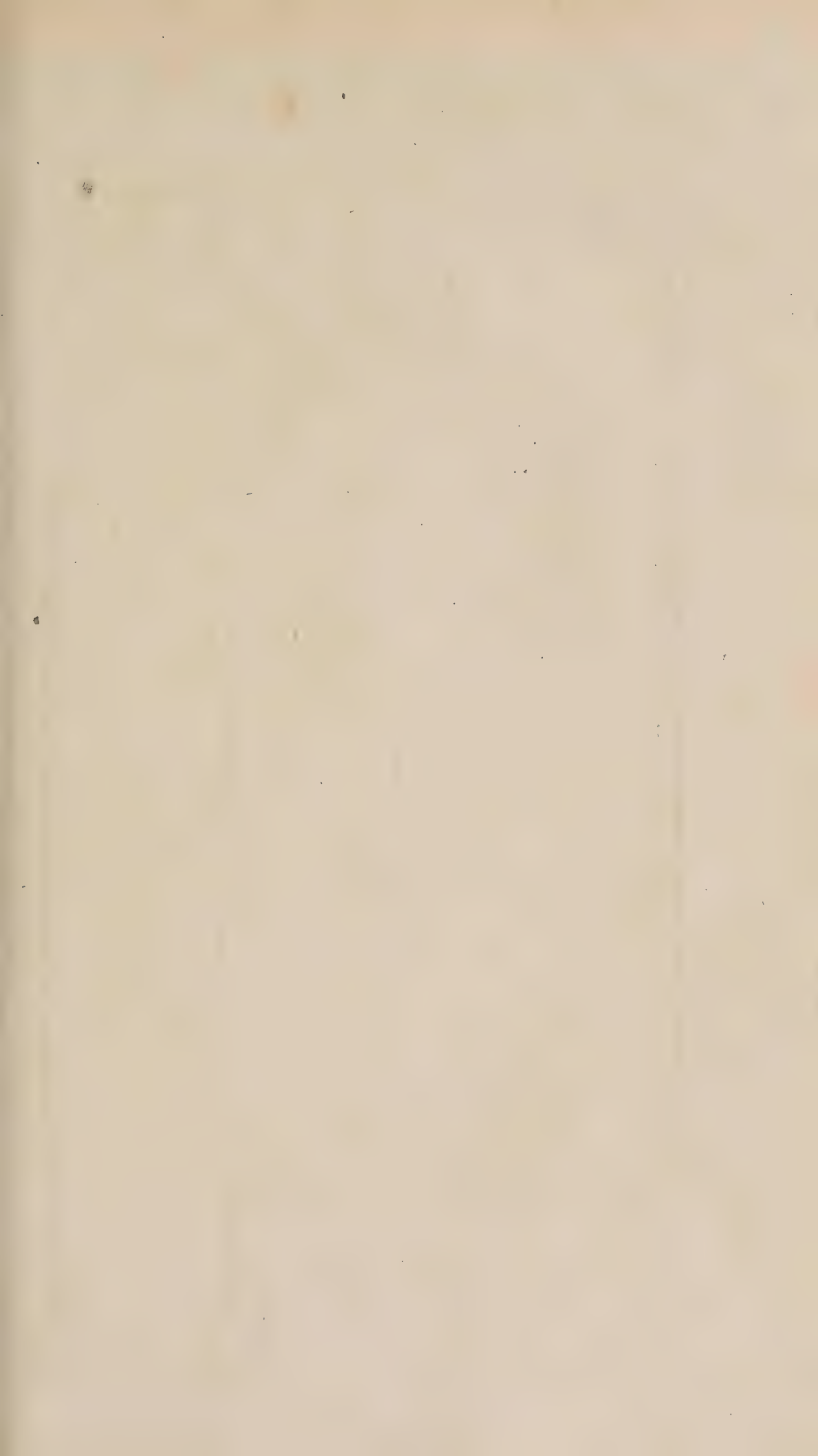


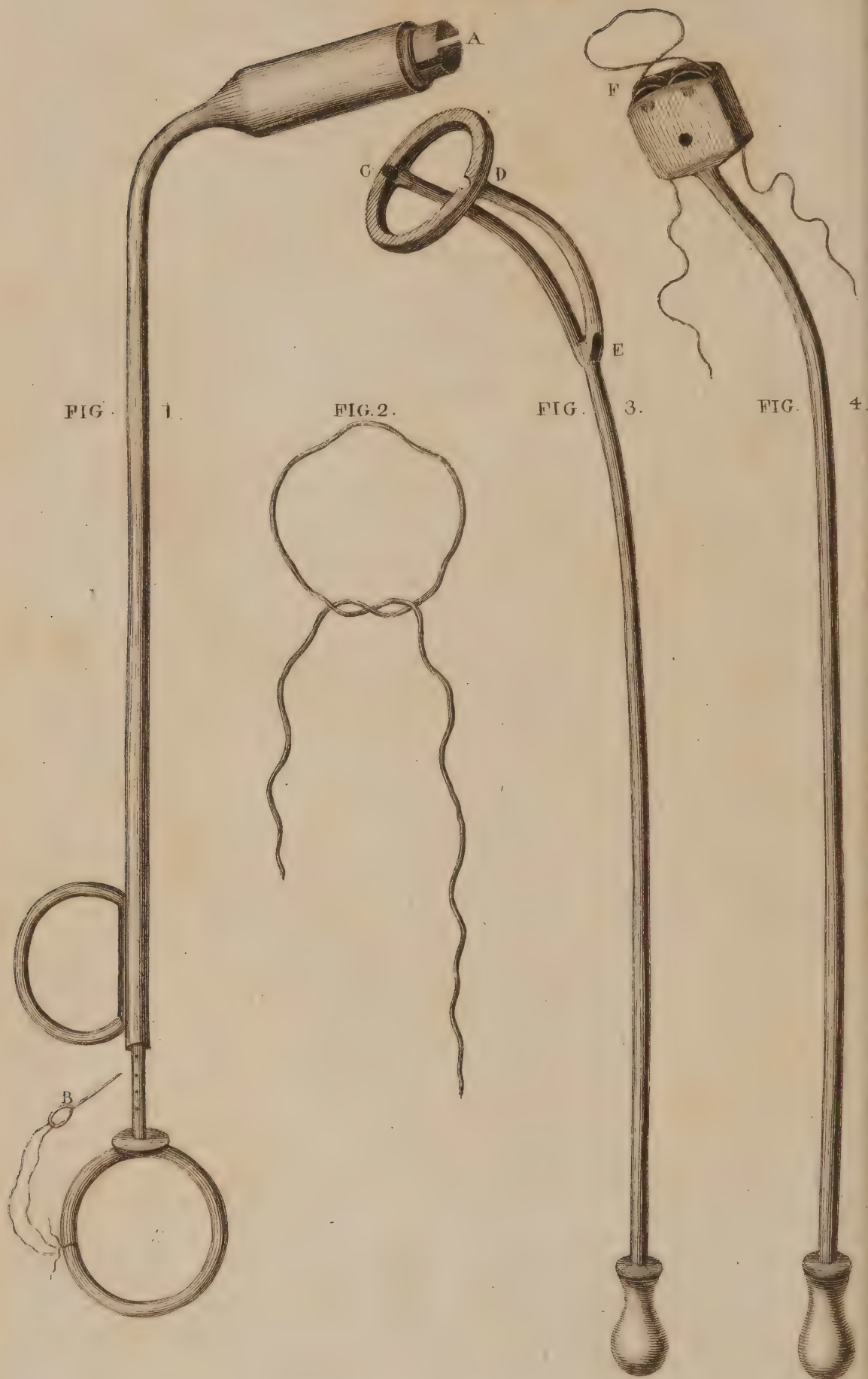
FIG. 3.













to the root of every polypus that can occur, however much the nostril may be distended by it.

## PLATE XLVII.

[Opposite to page 122.]

Fig. 1. An instrument for the purpose of applying caustic to any part of the mouth or throat. It may be made of silver or any other metal. *A*, A moveable tube in which the caustic must be fixed, when by pulling the ring at the other end of it, it must be drawn so far into the surrounding canula as to be completely covered with it; when the end of the instrument being applied upon the part affected, the caustic must be again pushed forward to a proper length, which may be always ascertained with exactness by means of the small pin tied by a thread to the ring at the opposite end of it. This, as well as the instruments of Plate XLVI. I am favoured with by Dr. Monro, whose improvements in surgery are numerous and important.

Figs. 2. 3. and 4. Are different parts of  
an

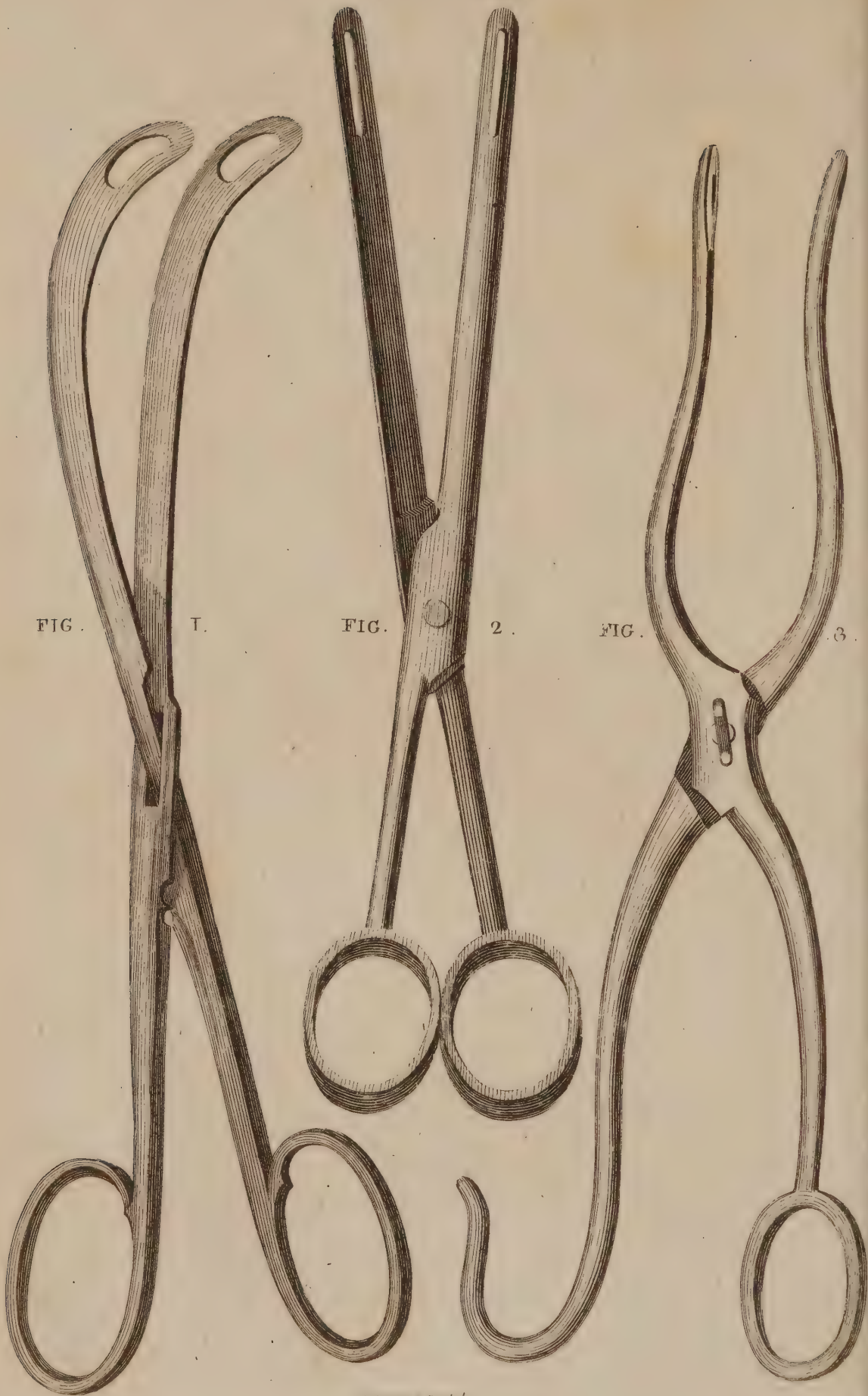
an instrument mentioned in page 111. for the purpose of putting a ligature round a polypus in the throat.

Fig. 2. A waxed thread with a noose upon it adapted to the size of the groove in the ring *CD*, fig. 3. *ED, EC*, Two tubular pieces of brass two inches and a half long, supporting the ring which is placed horizontally upon them. At the upper ends of each they should be made perfectly smooth and round, so as to allow the thread to slide more easily, and to prevent it from being cut by the edges of the tubes. *CD*, The apertures where the ends of the thread are inserted. *E*, One of the openings at which they are brought out. The other opening cannot be seen in this view of the instrument. The handle of the instrument is of strong brass-wire seven or eight inches long, and is bent a little that it may be the more easily introduced.

Fig. 4. An instrument for making a second noose. *F*, Two brass wheels fixed in a small case of brass. The two wheels  
are







are five-eighths of an inch broad, and half an inch deep. After forming a second noose, the ends of the thread should be passed over the wheels in the manner here represented, when the handle of the instrument being pushed upwards, a knot may be formed of any degree of tightness.

This instrument is evidently formed upon the same principle with the ring of Hildanus, Plate XLIV. fig. 3.

### PLATE XLVIII.

[Opposite to page 126.]

Fig. 1. Curved forceps for extracting polypi from the throat, and from behind the velum pendulum palati.

Fig. 2. Straight forceps for extracting polypi from the nostrils.

Fig. 3. Forceps for the same purpose with the last, but somewhat different in form. The method of using both these and the others is described in Chap. XXVIII, Sect. V.

PLATE

## PLATE XLIX.

[Opposite to page 144.]

Figs. 1. 2. and 3. Different forms of curved scissars, which may be employed with advantage in extirpating tumors within the mouth, as well as for other purposes.

Fig. 4. An instrument nearly of the form of a fleme, which answers better than any other for scarifying the gums of children in dentition.

## PLATE L.

[Opposite to page 154.]

Fig. 1. A scarificator for separating the gums from the roots of teeth intended to be extracted: It should be very sharp, but at the same time not so fine in the point or edge as to be hurt by being insinuated between the gums and the teeth.

Fig. 2. A curved trocar for perforating the antrum maxillare.

Figs. 3. and 4. Two dissecting hooks with two and three prongs, which answer better



PLATE XLIX.

FIG.

1.

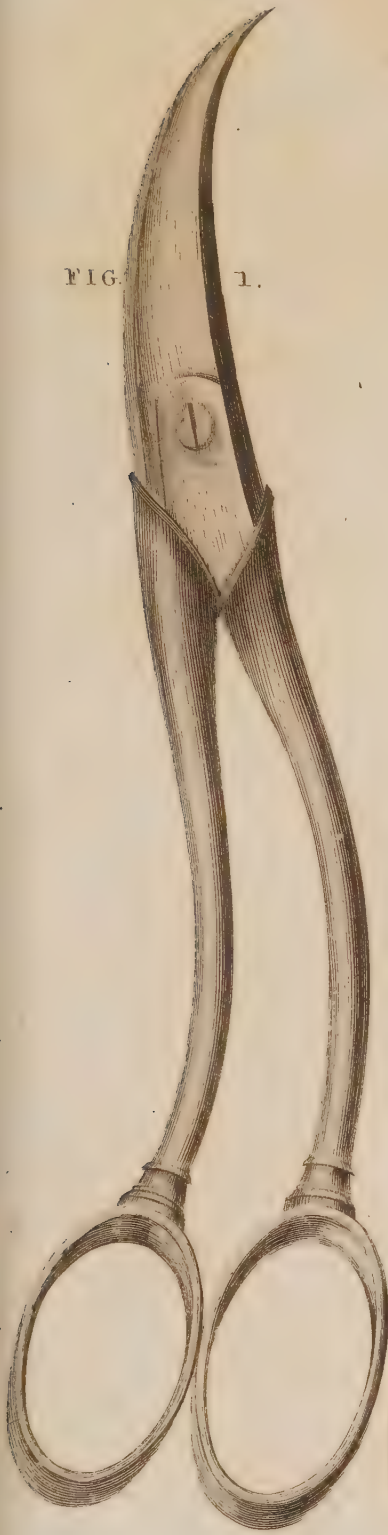


FIG.

2.



FIG.

3.

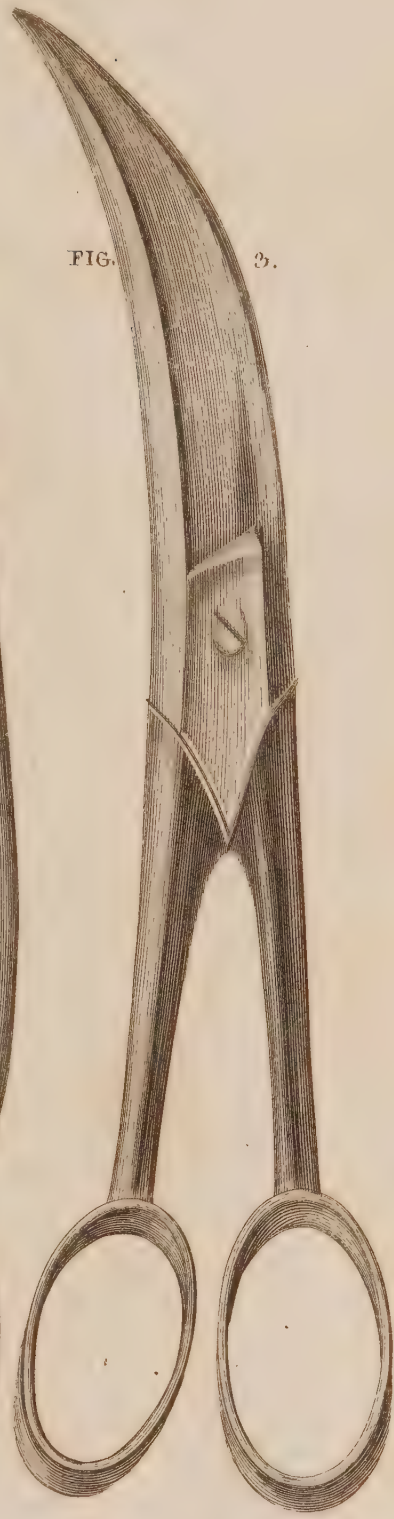


FIG. 4.



D. L. L. & S. sculp.

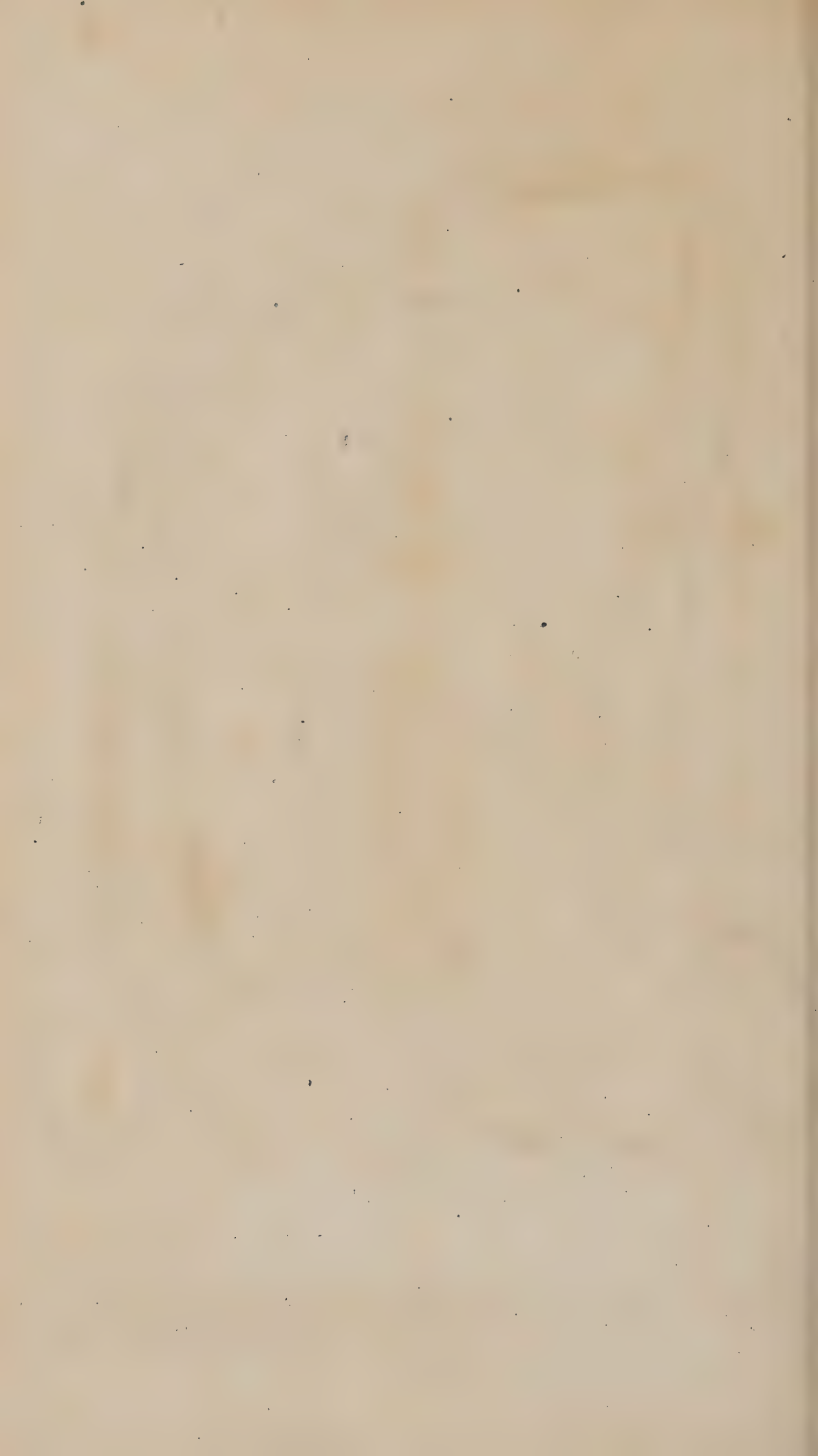
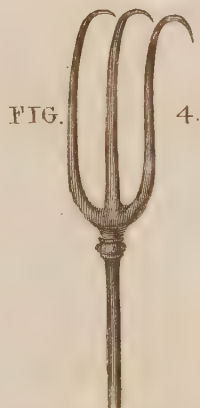
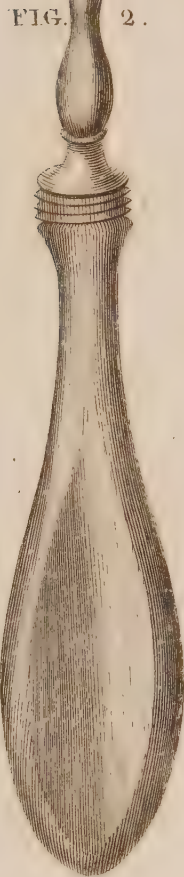


PLATE L.







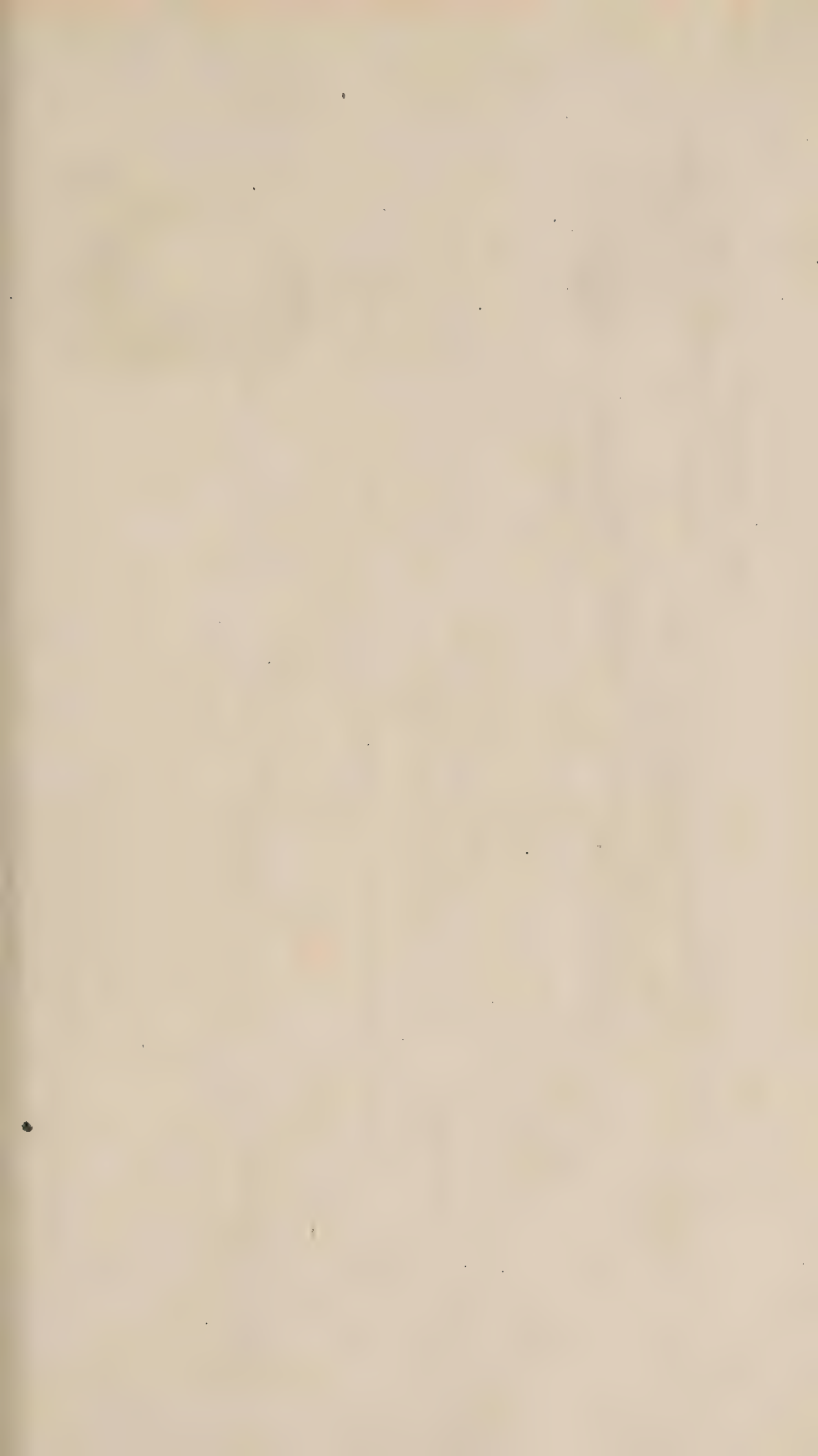


PLATE LI.

FIG. 1.

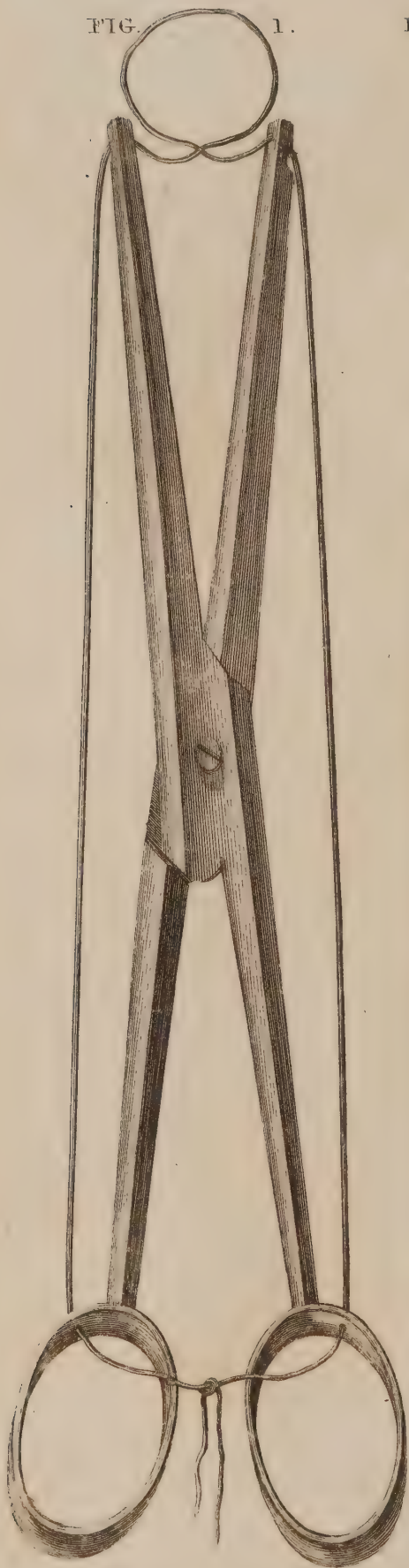


FIG. 2.

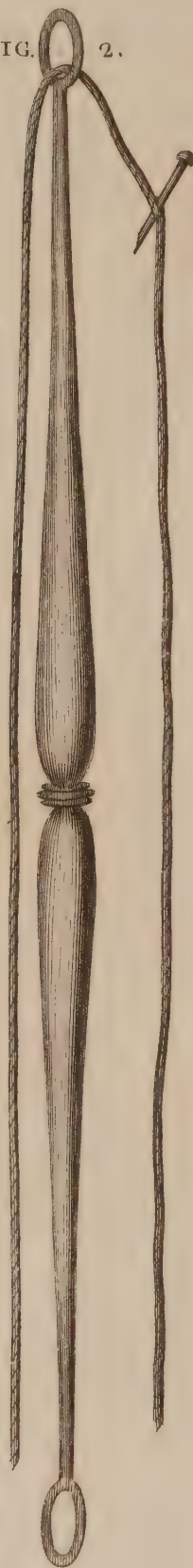


FIG. 3.

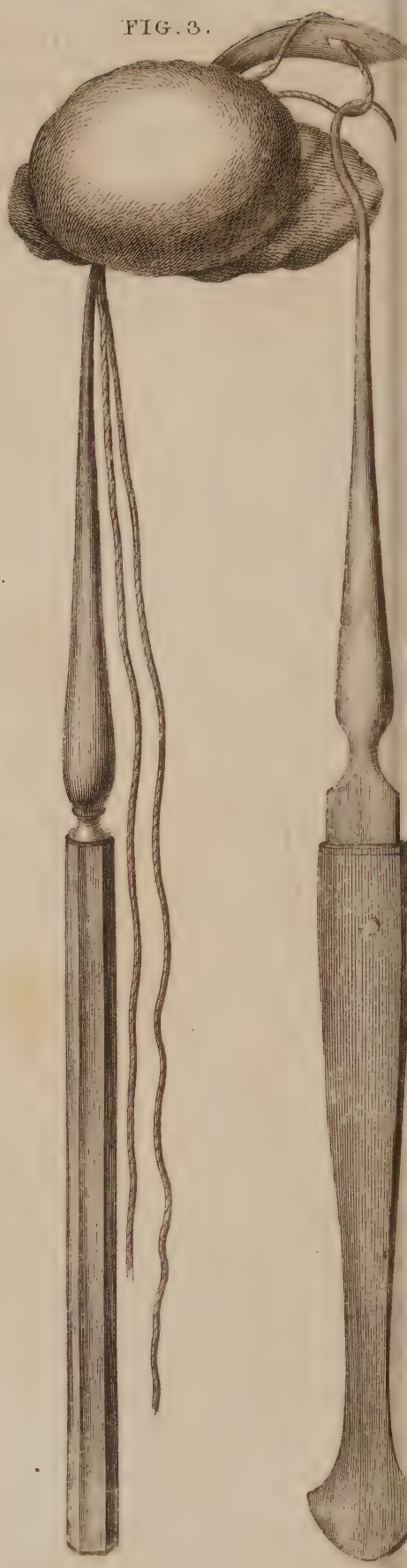






PLATE LII.

FIG.

1.

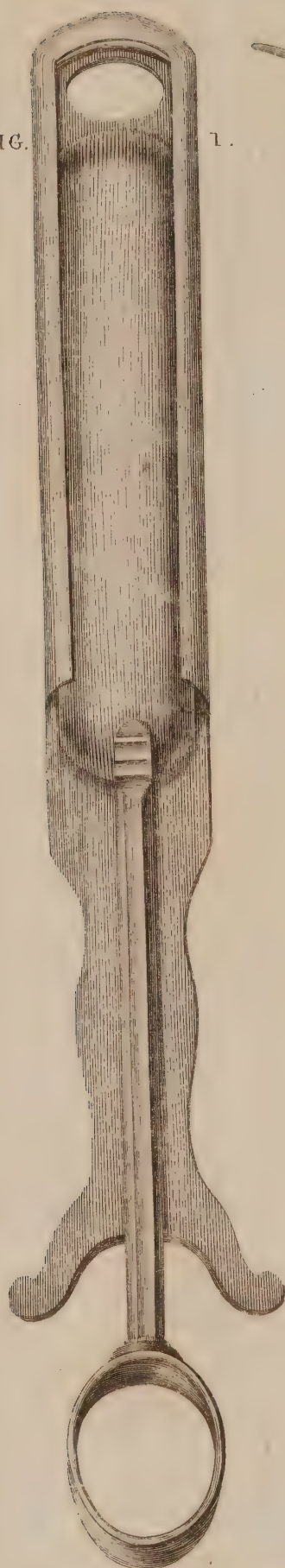


FIG.

2.

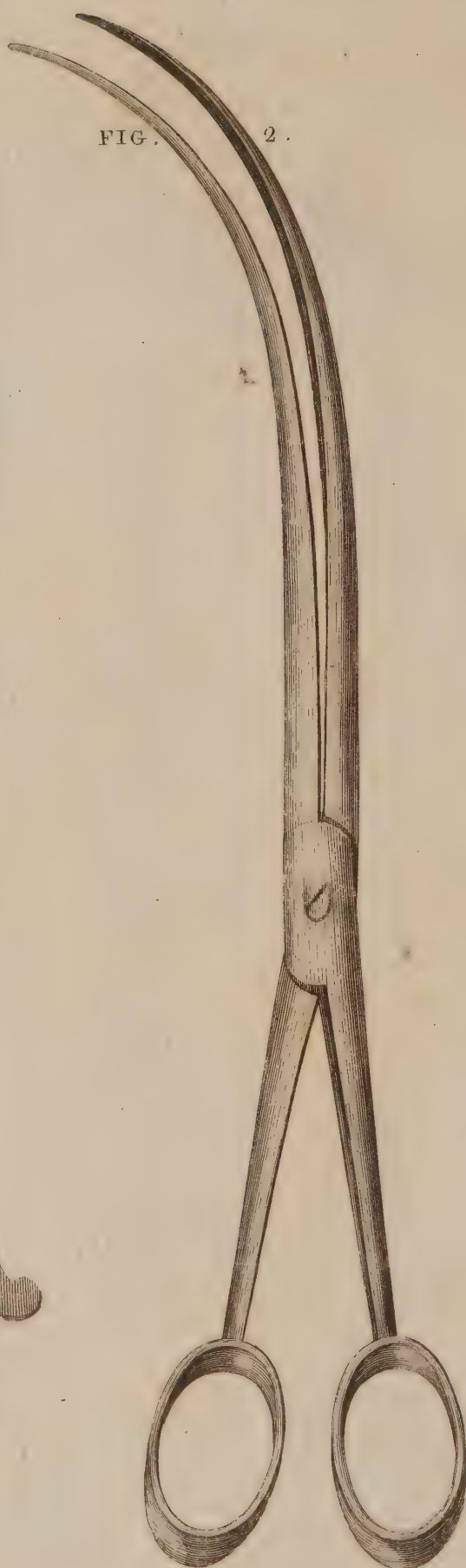


FIG.

3.



better for many purposes than the single pronged hook in common use.

### PLATE LI.

[Opposite to page 160.]

Fig. 1. An instrument for passing a ligature round the uvula or any other pendulous excrescence in the throat; but, although the proposal is ingenious, it does not answer the purpose so well as the instruments delineated in Plate XLIV. figures 1. 2. 3. and 4.

Fig. 2. An instrument first proposed by Mr Cheselden for tying a knot upon scirrhus amygdalæ after passing a ligature through the bases of the tumors, in the manner represented in fig. 3. The pin in fig. 2. is meant to represent a part upon which a knot is to be formed.

### PLATE LII.

[Opposite to page 164.]

Fig. 1. An instrument for removing the uvula by excision. That part of the uvula intended



intended to be removed being passed thro' the opening in the body of the instrument, the cutting slider, which ought to be very sharp, must be pressed forward with sufficient firmness for dividing it from the parts above.

Fig. 3. A curved probe-pointed bistoury for removing small tumors in the throat or any part of the mouth: And fig. 2. forceps for laying hold of tumors intended to be removed in this manner.

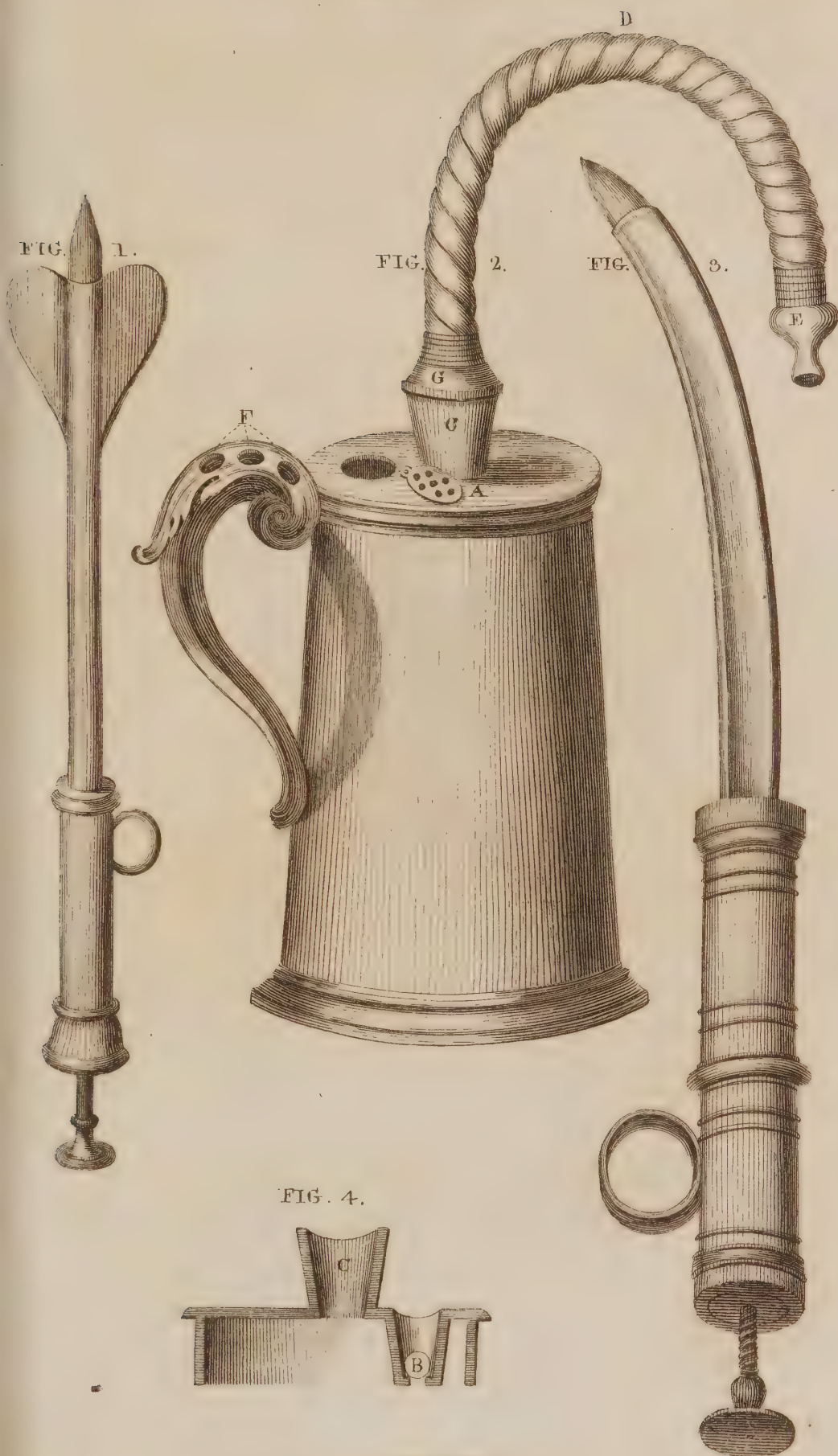
### PLATE LIII.

[Opposite to page 170.]

Figs. 1. and 2. Two scarificators of different forms for opening abscesses in the throat, and for scarifying the amygdalæ. The two wings with which the canula of fig. 1. is furnished, are intended for compressing the tongue, while the point of the instrument is passed more deeply into the throat.

Figs. 2. and 4. Mr Mudge's machine for conveying steams of warm water and

PLATE LIII.



DL 12 AR 5. Sculpt?





other liquids to the throat and breast. Fig. 2. The inhaler as it appears when fitted for use, except that the grating *A*, which then ought to cover the hole, is now turned back, to show the opening into the valve. Fig. 4. A section of the cover, in which is shown the construction of the cork valve *B*, and also the conical part *C*, into which the flexible tube *D* is fixed.

When the inhaler, which holds about a pint, after being three parts filled with hot water, is fixed at the arm-pit under the bed-cloaths, the end of the tube *E* is to be applied to the mouth; the air, in the act of inspiration, then rushes into the apertures *F*, and passing through the hollow handle, and afterwards into a hole in the lower part where it is soldered to the body and therefore cannot be represented, it rises through the hot water, and is received into the lungs, impregnated with vapour. In exspiration, the contents of the lungs are discharged upon the surface of the water; and instead of forcing the water back through the hollow handle, the  
air

air escapes by lifting the round light cork-valve *B*, so as to settle upon the surface of the body under the bed-cloaths.

Thus the whole act of respiration is performed, without ever removing the instrument from the mouth.

The flexible part of the tube *D* is about six inches long, fitted with a wooden mouth-piece *E* at one end, and a part *G* of the same materials at the other, to be received into the cone *C* on the cover. This flexible tube is made by winding a long slip of silk oil-skin over a spiral brass-wire. This should be then covered with one of the same size, of thin silk, and both be secured by strong sewing silk wound spirally round them. Some length and degree of flexibility is necessary to this tube, for the sake of a convenient accommodation to the mouth when the head is laid on the pillow.

Care should be taken by the workman, that the cover be made to fit very exactly; or, if it does not do so, the defect should be remedied by winding a  
I piece

piece of cotton wick, or some such contrivance, round the rim underneath the cover, so as to make it air-tight. The cork, likewise, which forms the valve, should, for the same reason, be made as round as possible. It is also necessary to remark, that the area of the holes on the upper part of the handle taken together; the size of the hole in the lower part of the handle which opens into the inhaler; the opening of the conical valve itself; and that in the mouth-piece; as well as the cavity or inside of the flexible tube, should be all equally large, and of such dimensions, as to equal the size of both nostrils taken together: in short, they should be severally so large, as not only not to obstruct each other, but that respiration may be performed thro' them with no more labour than is exerted in ordinary breathing.



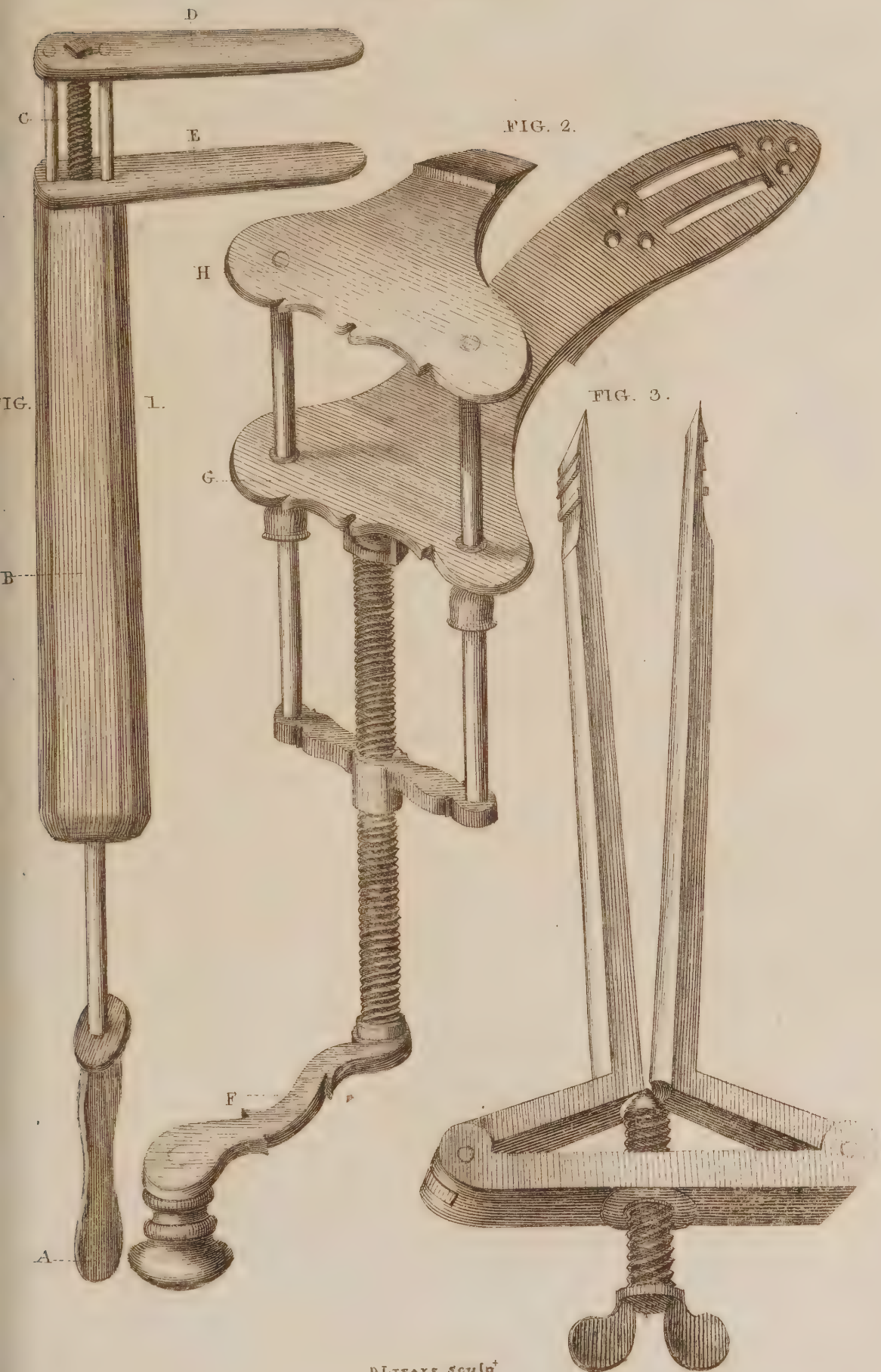
## PLATE LIV.

[Opposite to page 200.]

Fig. 1. A speculum oris, which I proposed a considerable time ago, and which indifferent cases has been used with advantage. By occupying less space in the mouth than the instruments in common use, it may be employed where they are inadmissible. *B*, The handle through which the screw *AC* is passed, by which the plate of iron *D* may be more or less separated from the fixed plate *E*, by turning the nut *A*. The plates *DE* should be sufficiently firm for resisting the pressure of the jaws, and they should be covered with leather or cloth to prevent the teeth from being injured.

Fig. 2. Another form of a speculum for the mouth. *GH*, Two firm iron plates, which being inserted between the teeth of the upper and under jaws, may be separated to any necessary degree by turning the handle *F*. The farther extremity of the plate *G* is intended to compress the  
tongue,

PLATE LIV.



D. LIXARS. sculp.

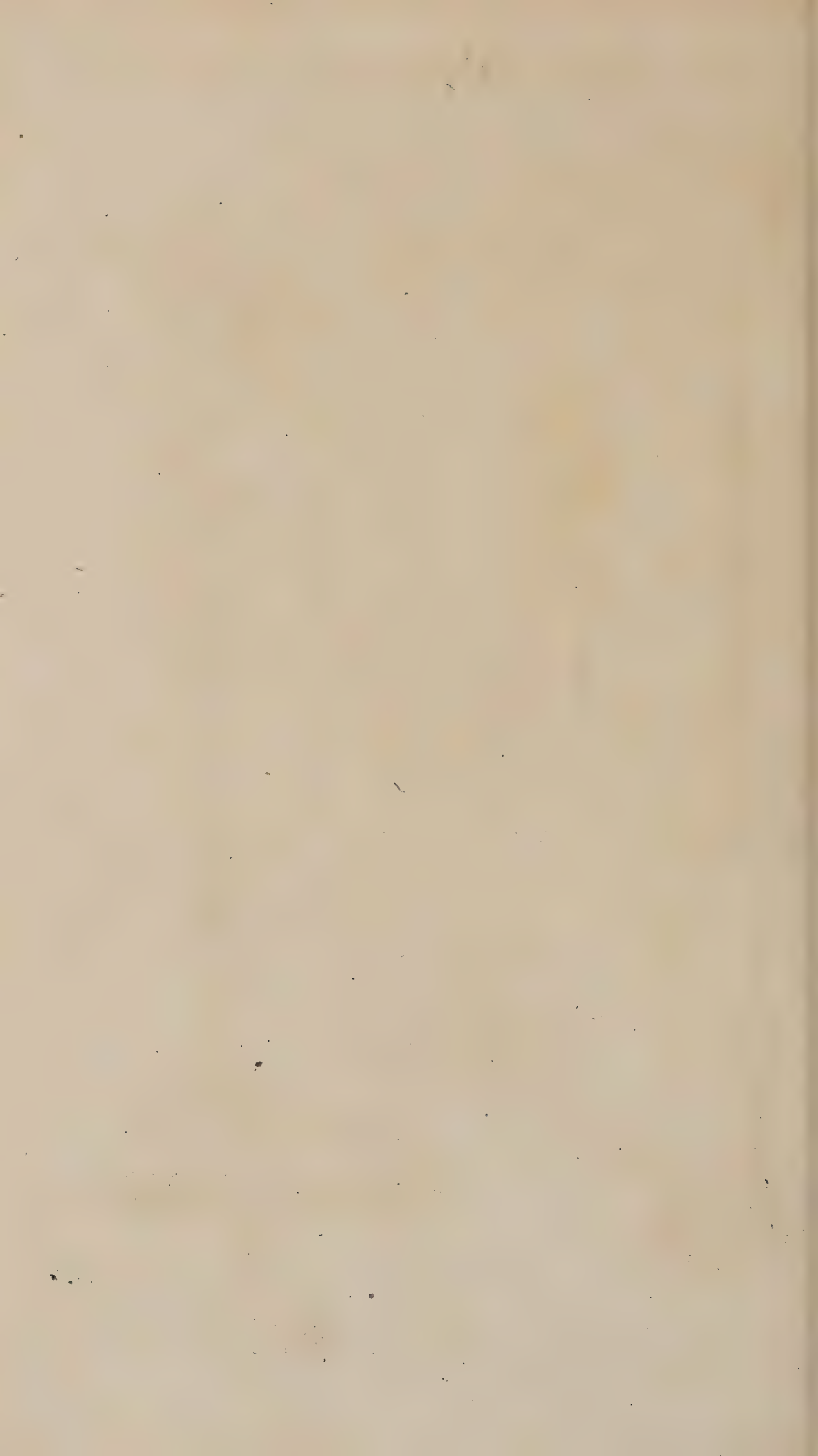






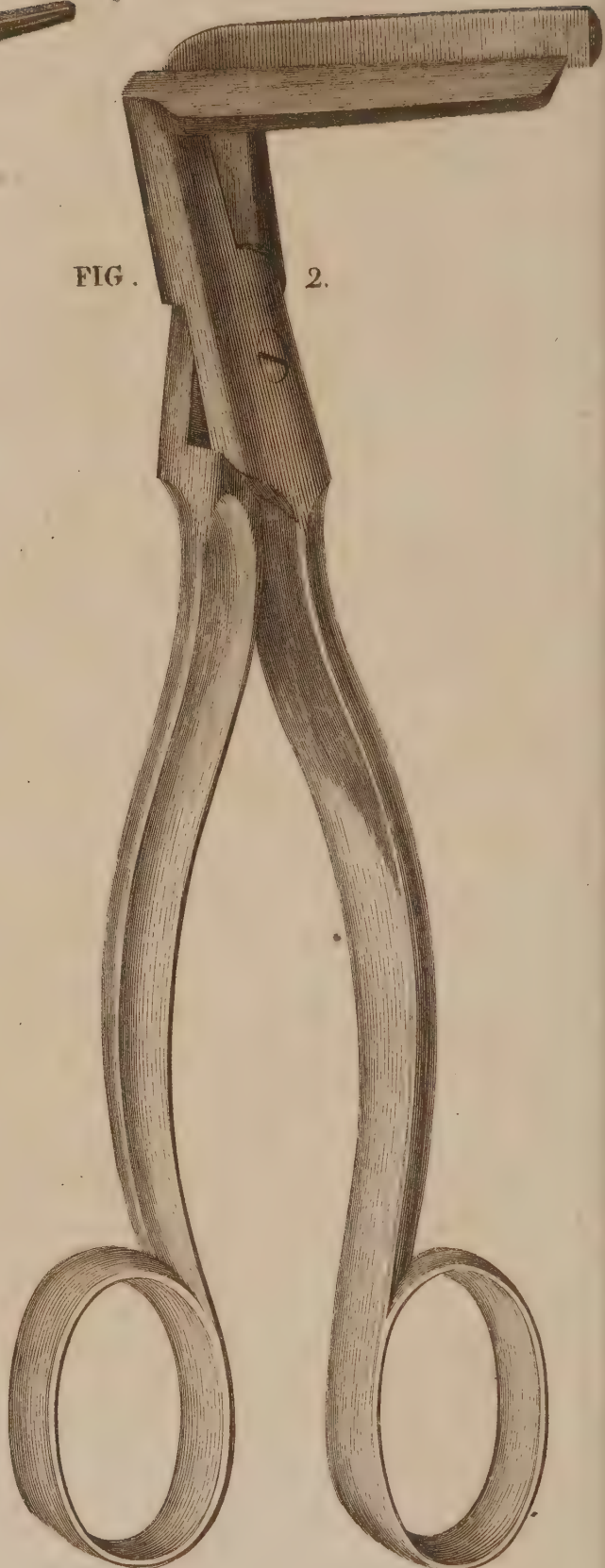
FIG.

1.



FIG.

2.



tongue, an addition which may be easily made to fig. 1.

Fig. 3. The instrument in common use as a speculum oris, but it is so very defective that it can seldom be used with much advantage.

### PLATE LV.

[Opposite to page 208.]

Fig. 1. Forceps for laying hold of the lip in performing the operation for the hare-lip. It may be done with the fingers alone, but the parts cannot be so neatly cut in this manner as when the forceps are employed.

Fig. 2. A kind of cutting forceps, the invention of Dr John Aitken : They may be employed either in the hare-lip, or in the removal of cancerous affections of the lip : One blade of the forceps is a plane smooth surface, while the other is furnished with a sharp cutting edge. In using this instrument the two blades must be pressed against each other with one hand,

D d 2

with



with a force sufficient to divide the parts that are meant to be cut; while the other hand is employed in securing the handles.

### PLATE LVI.

[Opposite to page 224.]

Fig. 1. Scissars of a size and strength sufficient for dividing the parts in the operation for the hare-lip. It is not probable that they will ever be generally employed, but I think it right to delineate a size of the instrument which by experience is found to answer.

Fig. 2. Cutting pliers for the purpose of removing small splinters of bone wherever they are met with.

### PLATE LVII.

[Opposite to page 236.]

As the treatment of the hare-lip is a point of much importance, I have judged it proper to delineate the appearance of the disease, together with that of the parts in which

PLATE LXI

FIG.

I.

FIG.

2.

FIG.

3.



FIG. 4.





PLATE IVI.

FIG.

1.

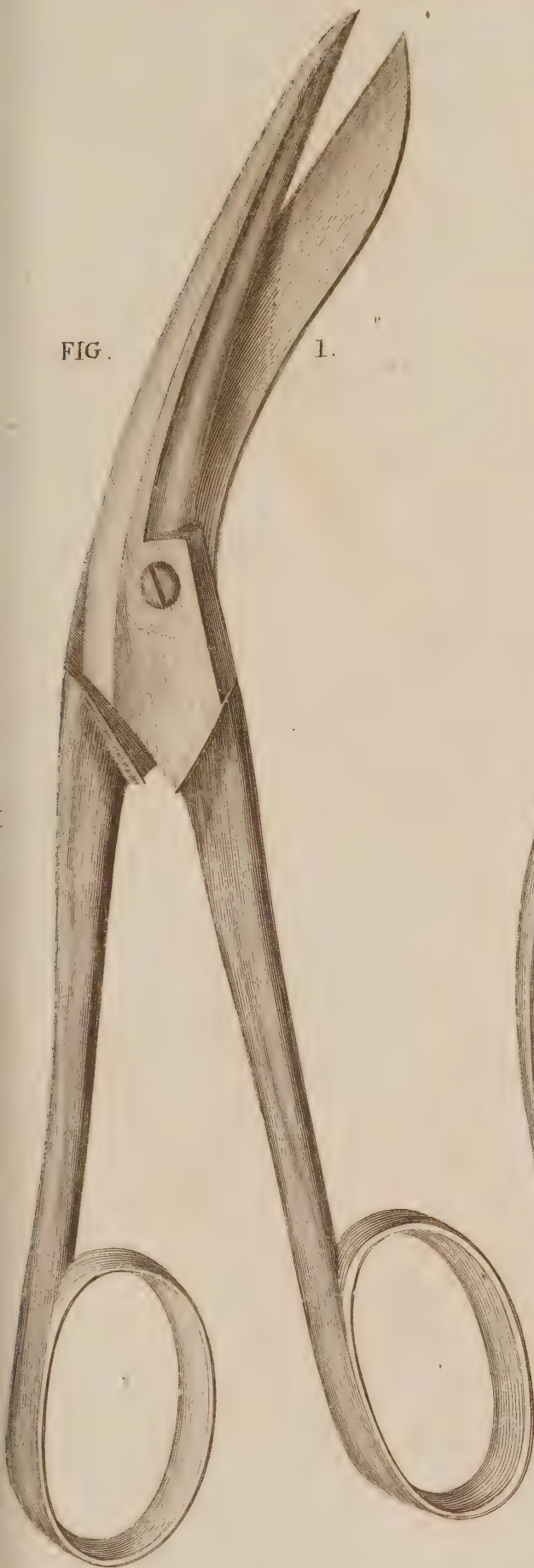


FIG.

2.

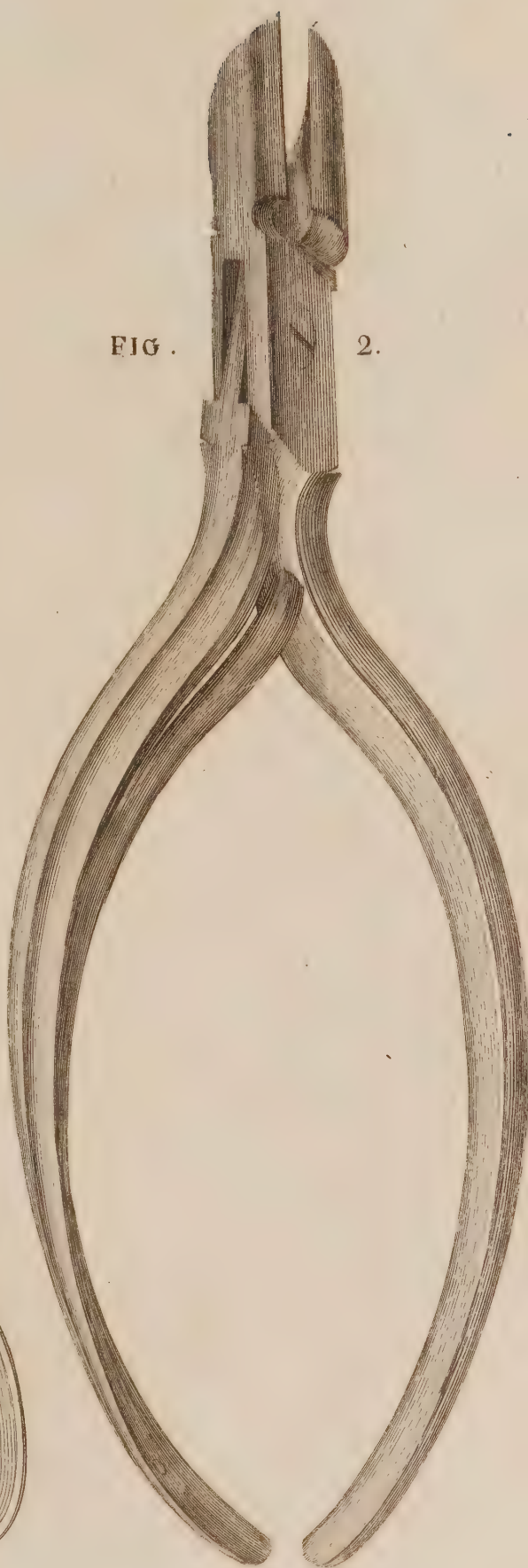




PLATE LVII.

FIG. 1.

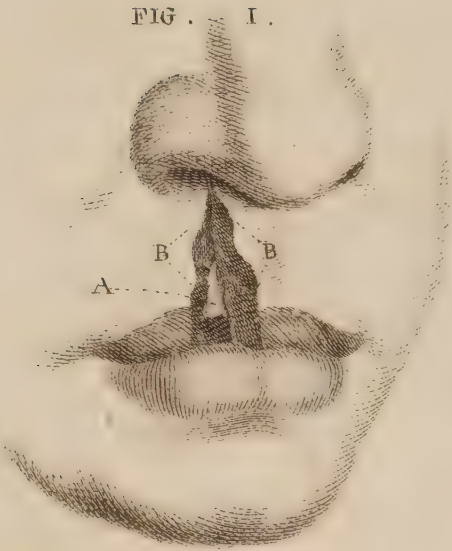


FIG. 2.

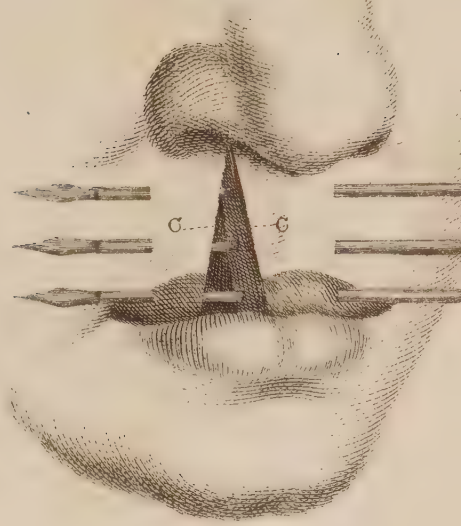


FIG. 3.

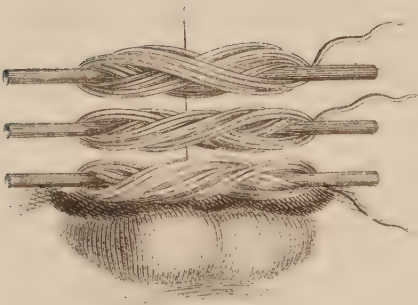


FIG. 4.

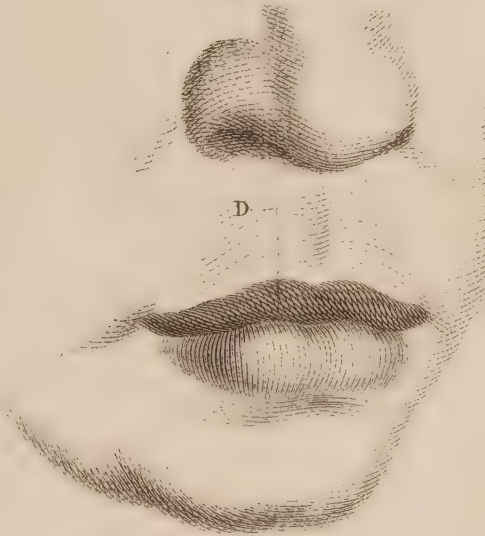


FIG. 5.

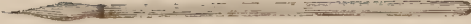


FIG. 6.

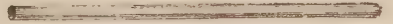


FIG. 7.







which it is seated during the different stages of the operation and cure.

Fig. 1. A case of hare-lip in the upper lip. *A*, One of the incisores appearing in the centre of the opening, which ought to be removed before the operation, as a tooth in this situation is very apt to interrupt the cure. *BB*, The unequal edges of the fissure with which this affection is very commonly attended.

Fig. 2. The appearance of the parts after the edges of the fissure have been removed and the pins introduced. *CC*, The edges of the cut, which ought to be smooth, equal, and exactly of the same length on each side, so that when drawn together no inequality may be perceptible. The first pin should be inserted near to the under part of the lip, and the upper pin near to the superior point of the fissure. The pins represented in this figure are furnished with moveable steel points, so that the points may be taken away on the ligatures being applied, as is delineated in fig. 3.

D d 3

which

which exhibits the appearance of a hare-lip immediately after the operation.

Fig. 4. A lip after the cure is completed: *D*, Represents the appearance of the cicatrix, which in general ought to be nearly a straight line.

Fig. 5. A flat pin for the operation of the hare-lip. The pin itself fig. 6. should be of gold, and the point fig. 7. of steel.

### PLATE LVIII.

[Opposite to page 242.]

Figs. 1. 2. 3. 4. and 5. Different forms of scaling instruments for removing tartar and other extraneous matter from the teeth.

Figs. 6. and 7. Instruments that may be employed either for burning the nerve of a tooth, or for stuffing a hollow tooth with gold or lead. Fig. 8. may likewise be employed for the same purpose, but it is more frequently used for searching behind and between the teeth when there is  
any



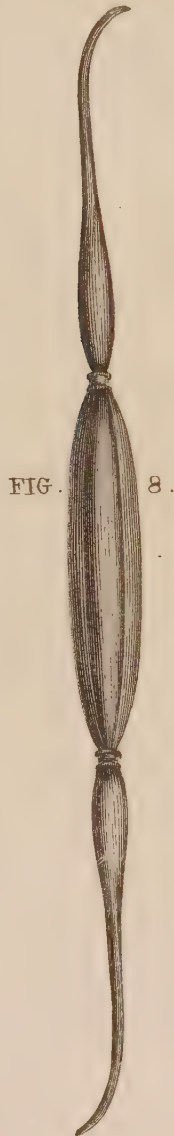
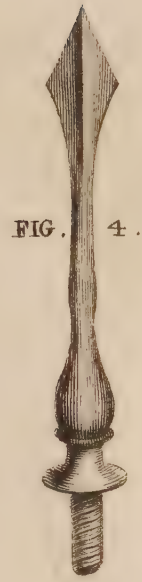
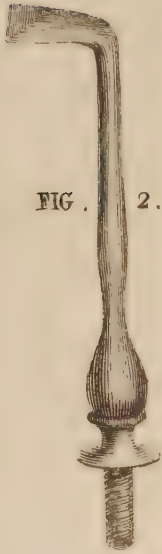
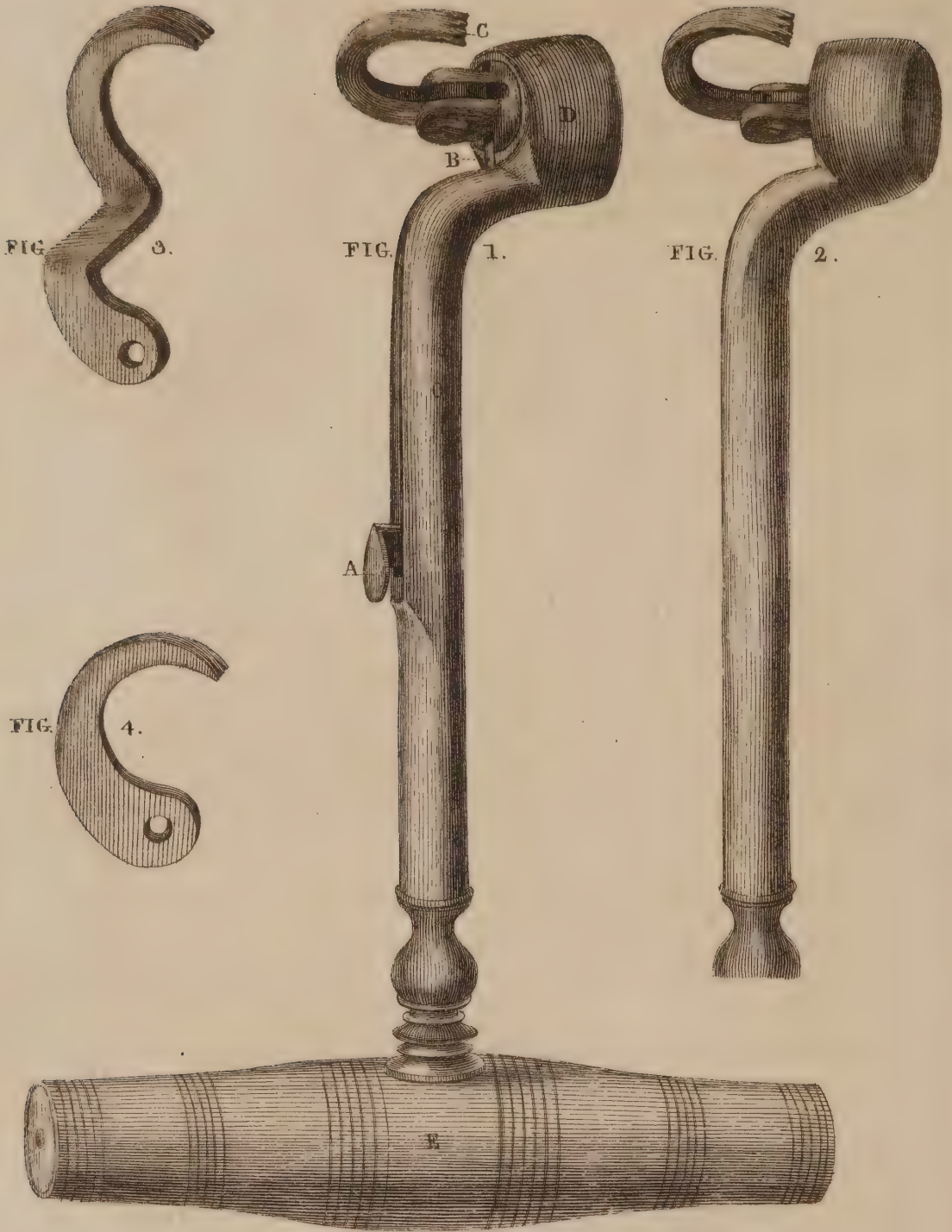








PLATE LIX.



when the Sewist

any suspicion of a latent caries that is not readily discovered.

Fig. 9. Another instrument for stuffing carious teeth. And,

Fig. 10. A handle to which all these instruments may be fitted.

### PLATE LIX.

[Opposite to page 276.]

Fig. 1. The instrument commonly termed a Key for extracting teeth. After a variety of alterations in the form of it, the one here delineated is the best I have ever met with.

In fig. 2. the instrument in common use, the claw is fixed, and can only be moved by taking out the screw by which it is connected with the instrument; but in this it may be moved from one side to another, merely by pressing upon the nut *A*, by which the spring *B* is raised out of a nitch in a wheel which is thus rendered moveable, and in which the claw is fixed. *D*, The heel of the instrument, which is

D d 4

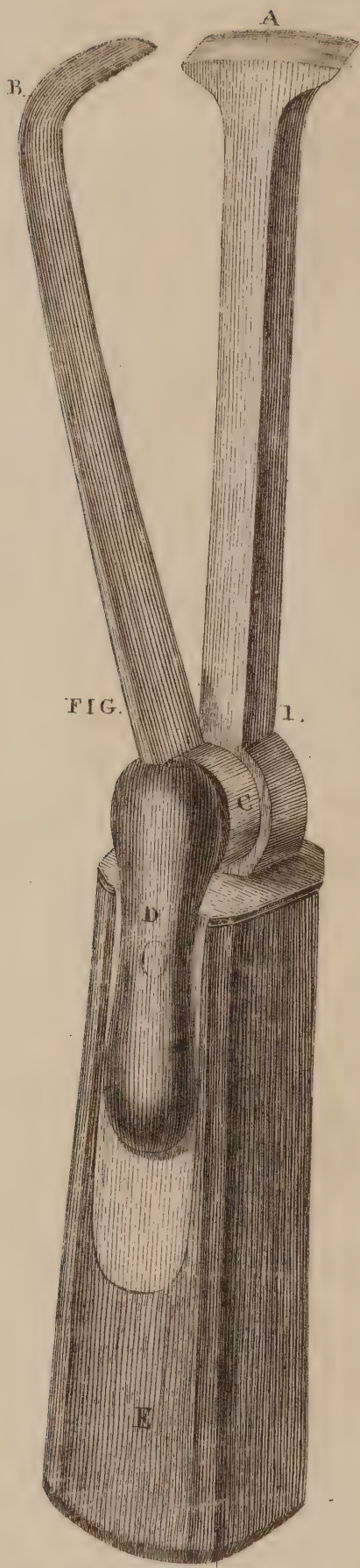
here

here represented not only of a greater depth, but considerably longer than it is usually made: Of this length it is applied to a considerable extent of gums, by which the jaw is not so apt to suffer as when it is much shorter; and of this depth it acts with more power than when of the usual form. This part of the instrument should not only be well polished, but it ought to be thickly covered with several plies of soft old linen, in order to render the pressure produced by it upon the gums as easy as possible. The handle *E* is sometimes made of iron; but it answers better either of ivory or timber.

Fig. 3. A claw bent in such a manner, that when the heel of the instrument *D* is placed upon any part of the gums, the second or third tooth farther in the mouth may be pulled with it. This proves sometimes useful, where the gums opposite to the affected tooth are particularly tender; and it should always be employed when it is meant to pull either of the two farthest molares of the lower jaw outwards; for  
when







when the common instrument is used, the gums which cover the projecting part of the coronoid process of the jaw are always much lacerated.

Figs. 4. and 5. Two claws of different sizes of the ordinary form.

### PLATE LX.

[Opposite to page 291.]

Figs. 1. and 3. Two instruments much employed in different parts of Europe for extracting teeth. They do not, however, possess any advantage over the key instrument; and they are liable to this objection, that they cannot be used where it is necessary to turn a tooth towards the inside of the mouth.

Fig. 1. *A*, The fulcrum, which ought to be well covered with soft old linen. *B*, The claw fixed to the handle *E*, by a small hole in the end of it, which receives a knob of a corresponding size at *C*, and it is retained in its situation by a moveable plate of polished iron *D*. The handle



should be wood, and all the rest of the instrument of iron or steel. Fig. 2. A claw with a considerable degree of curvature, for extracting teeth at a greater depth in the mouth than the fulcrum can be placed at.

Fig. 3. *F*, The fulcrum. *E*, A straight claw fixed to the instrument by a screw at *H*. *I*, The handle, which should be of wood.

### PLATE LXI.

[Opposite to page 285.]

Figs. 1. 3. and 4. Different forms of forceps for extracting teeth. Fig. 3. is perhaps the most useful of any.

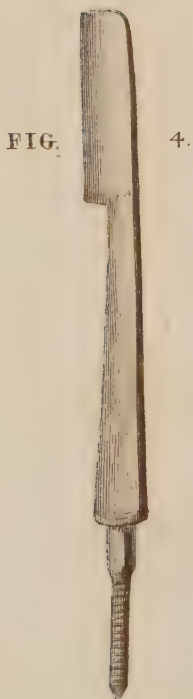
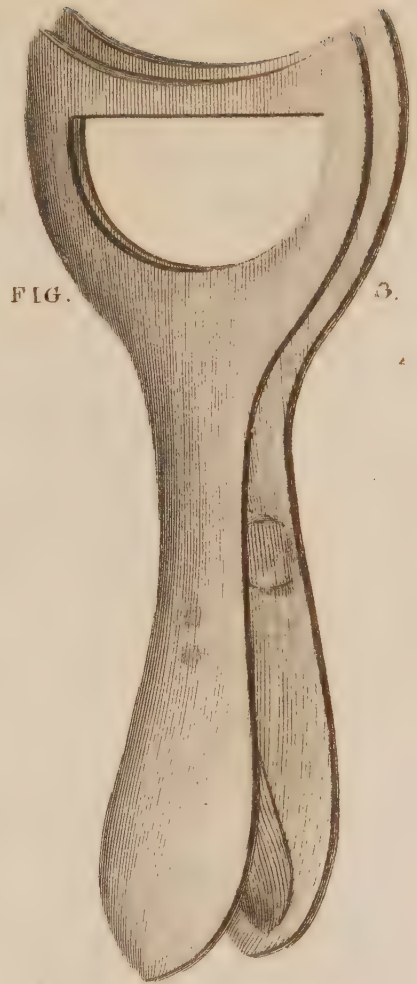
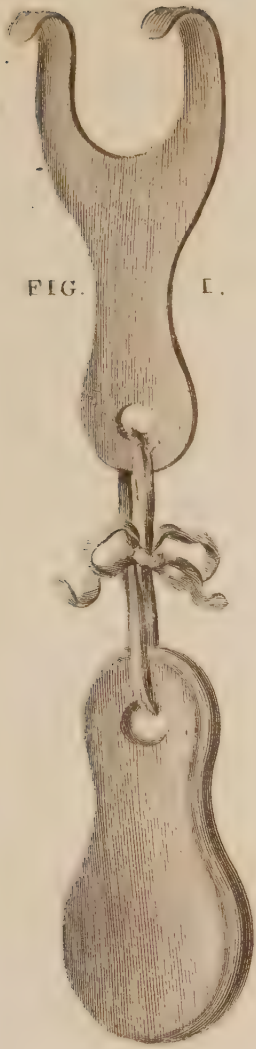
Fig. 2. Small dissecting forceps employed in different operations in the mouth, as well as in other parts.

### PLATE LXII.

[Opposite to page 293.]

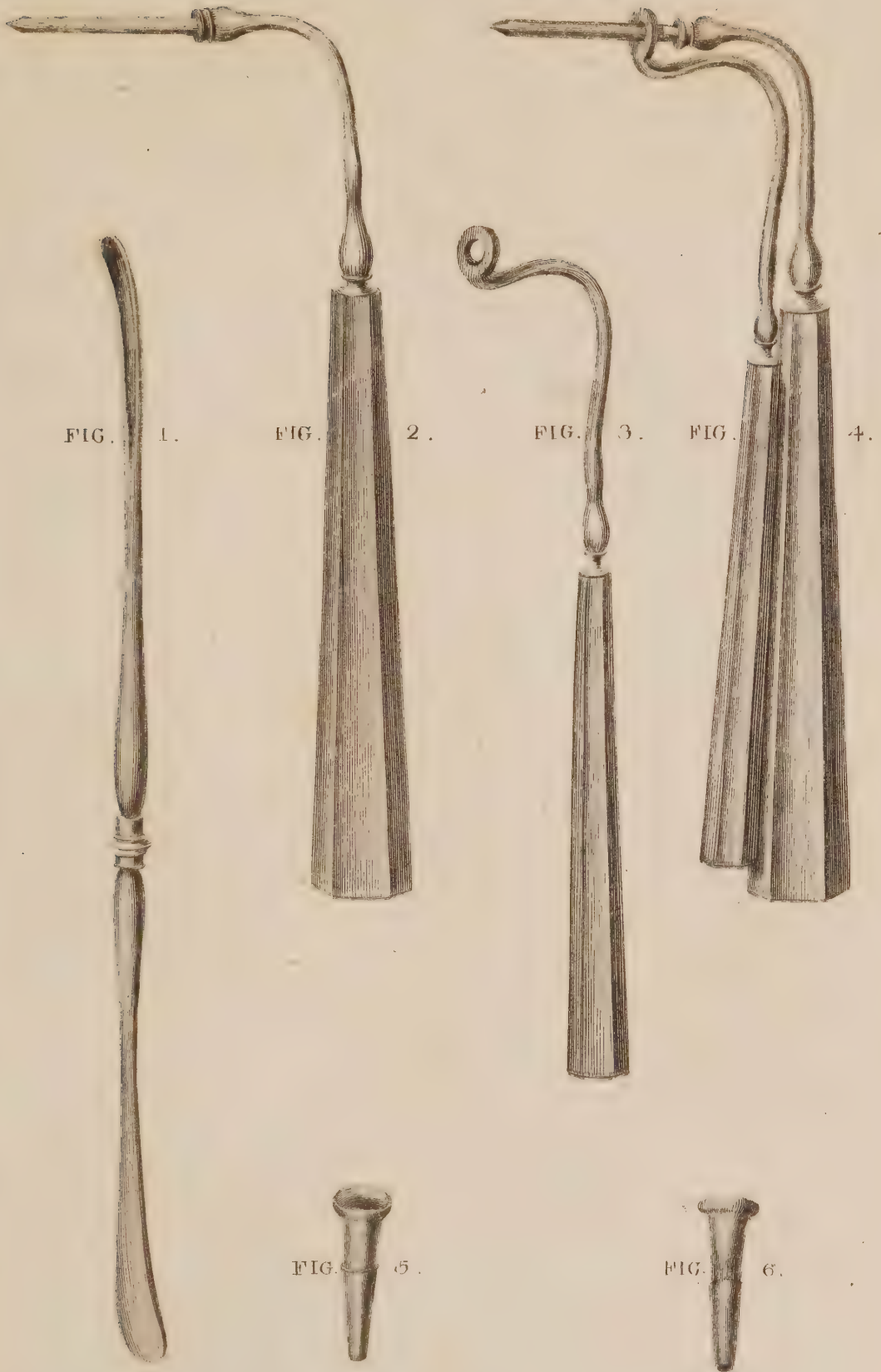
Fig. 1. Teeth forceps with moveable claws. And,

Fig.





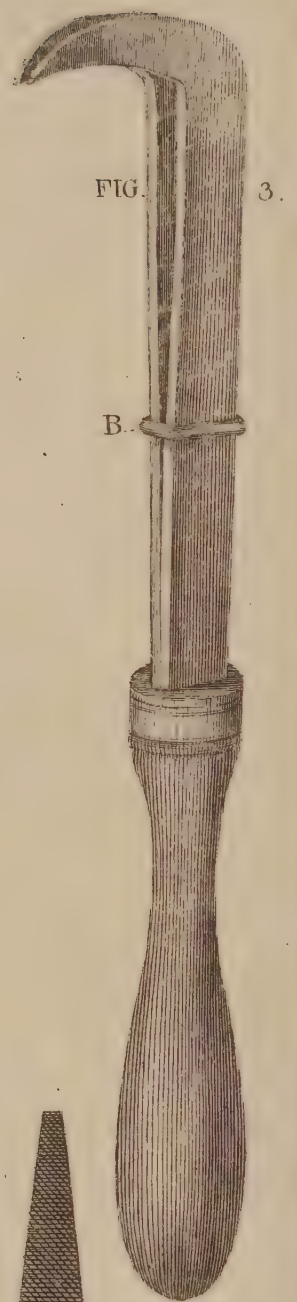
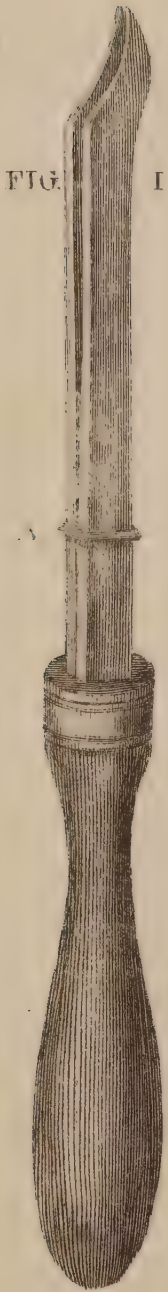














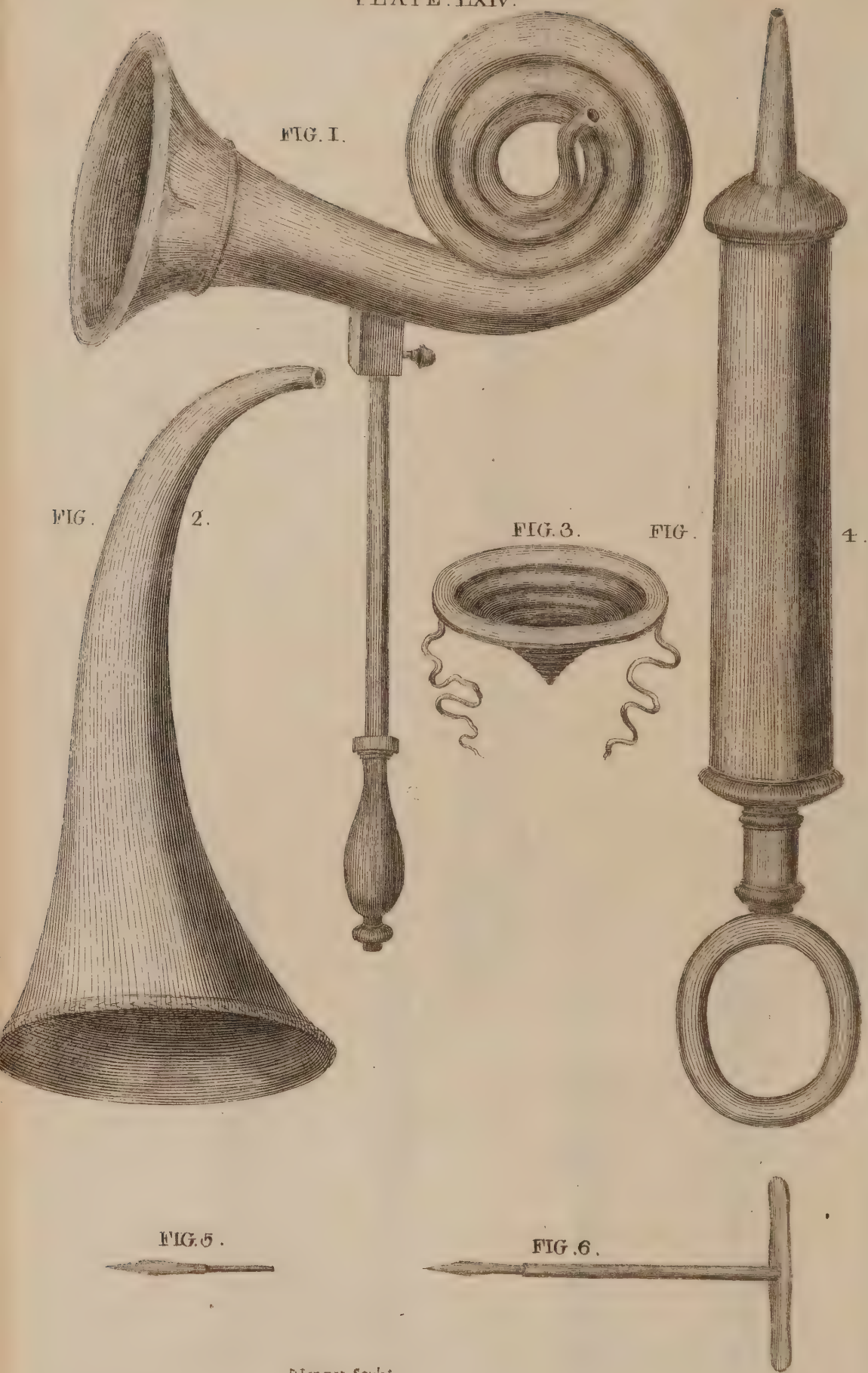




Fig. 2. A fulcrum to be used along with them, both described in page 293.

Fig. 3. An instrument for dividing the frenum linguæ, described page 338.

PLATE LXIII.

[Opposite to page 300.]

Figs. 1. 2. and 3. Different forms of a punch or lever for extracting stumps of teeth. The method of using them is described page 300. Figs. 1. and 3. are the best. They consist of two parallel plates of polished iron, which may be separated more or less by pressing the moveable sliders *AB* higher or lower.

Figs. 4. 5. 6. and 7. Different forms of files for removing inequalities upon the teeth.

PLATE LXIV.

[Opposite to page 361.]

Figs. 1. 2. and 3. Different forms of instruments employed for concentrating  
2 found

found in cases of deafness, described in page 361.

Fig. 4. A syringe of a proper size for washing the meatus auditorius externus.

Figs. 5. and 6. Instruments for perforating the lobes of the ear, described page 363.

### PLATE LXV.

[Opposite to page 372.]

Figs. 1. 2. and 3. Different forms of glasses for drawing milk from the breasts of women. With figs. 1. and 3. the breast may either be sucked by the person herself, or by an assistant; and fig. 2. is a glass cup, mounted with a bag of elastic gum. *A*, The glass cup joined to the bag *C* by the intervention of a brass tube *B*. They are more particularly mentioned in page 372.

PLATE



FIG. 1.

FIG. A. 2.

FIG. 3.









FIG. 1.

FIG. 2.

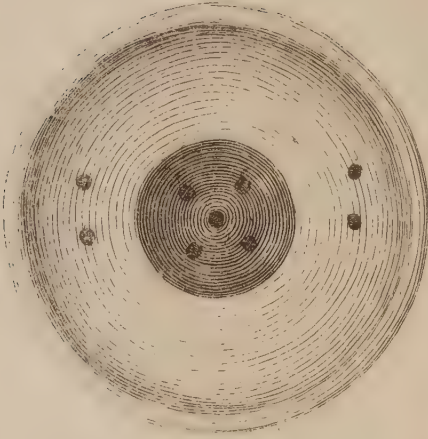


FIG. 3.

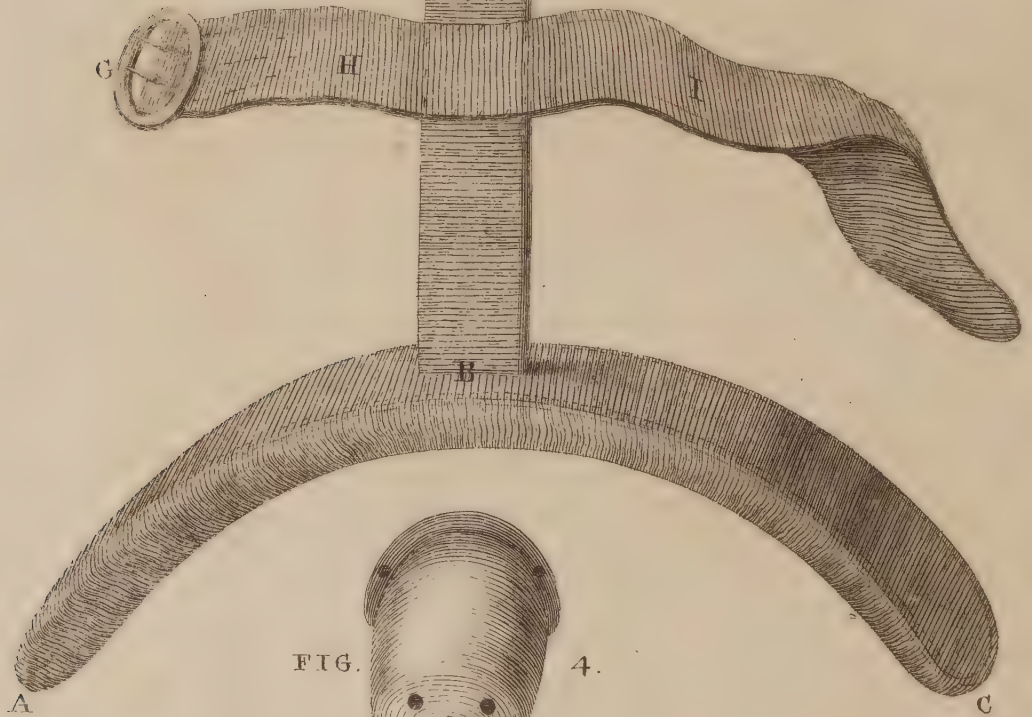
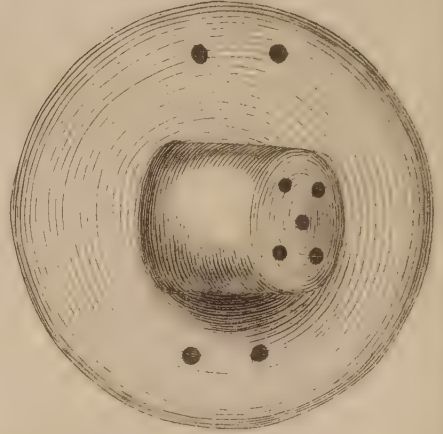
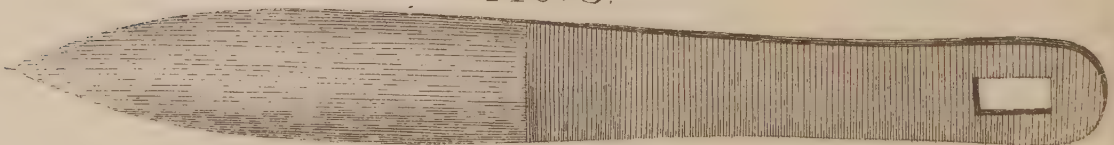


FIG. 4.



FIG. 5.





## PLATE LXVI.

[Opposite to page 374.]

Fig. 1. An instrument mentioned in page 371, for supporting the head after the operation for the wry neck. *ABC*, A curved plate of iron fitted to the shoulder, and supporting another plate, to the top of which is connected the plate *DEF*, upon which the head is meant to rest, and which therefore should be covered with soft leather or cotton. *GHI*, A buckle and strap for fixing the instrument round the neck.

Figs. 2. 3. and 4. Different kinds of cups, which may be either of ivory, lead, or silver, for covering the nipples and protecting them from the cloaths, when they are either chopped or otherwise diseased. The holes in their brims are for receiving pieces of small tape for fixing them round the body.

Fig. 5. A broad flat needle, of a lancet-form,

form for introducing cords or setons in different parts of the body.

## F I N I S.

### E R R A T A.

Page 277. line 10. For B read *C*.

line 15. For C read *D*.

Page 293. line 12. For BCD read *BFD*.

line 18. For BCD read *BFD*.

line 21. For FGHI read *GHIK*.

### DIRECTIONS TO THE BOOKBINDER.

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